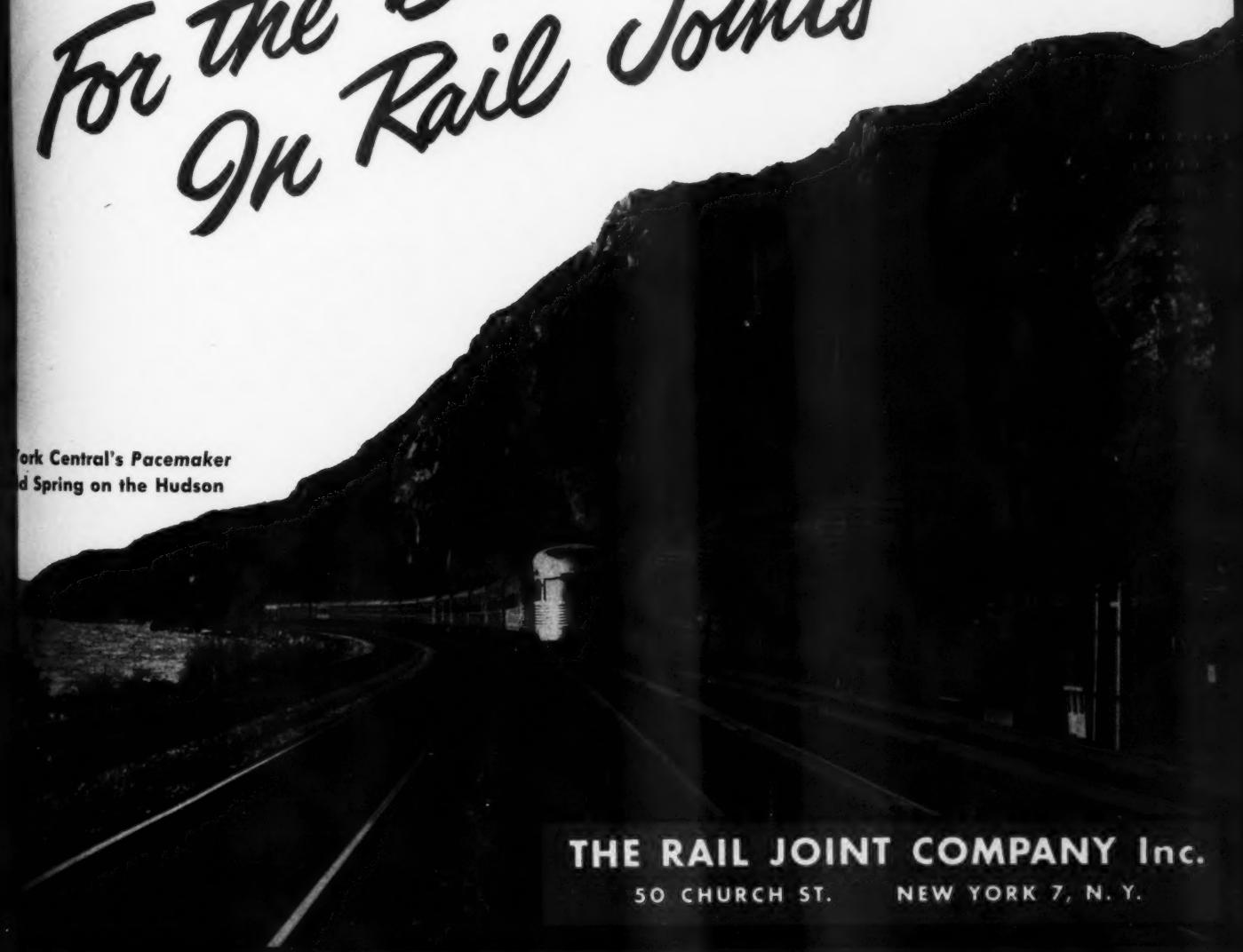
September 1955

RAILWAY TRACK and STRUCTURES

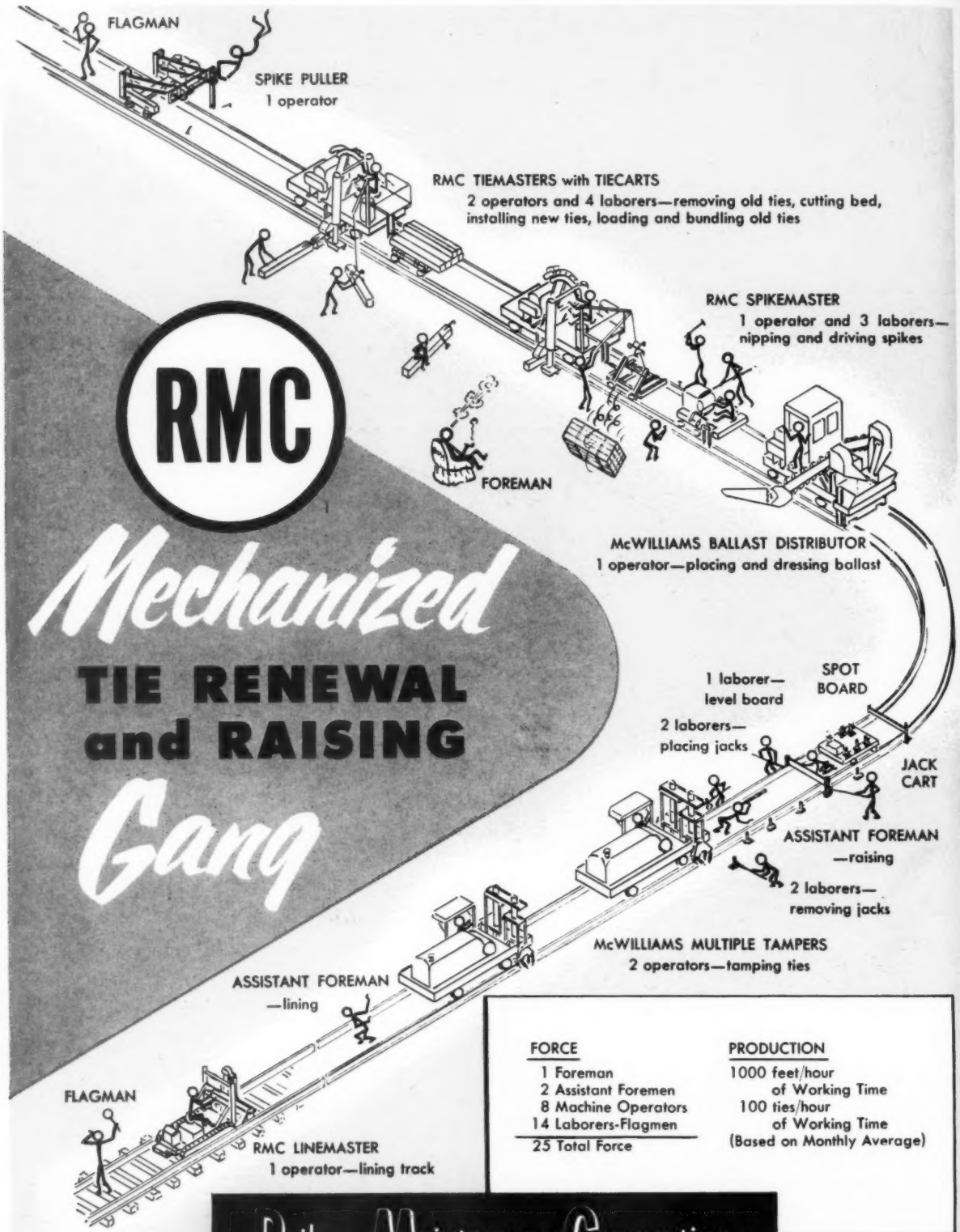
One of Five Specialized Railway Age Publications

For the Best In Rail Joints



York Central's *Pacemaker*
d Spring on the Hudson

THE RAIL JOINT COMPANY Inc.
50 CHURCH ST. NEW YORK 7, N. Y.



RMC

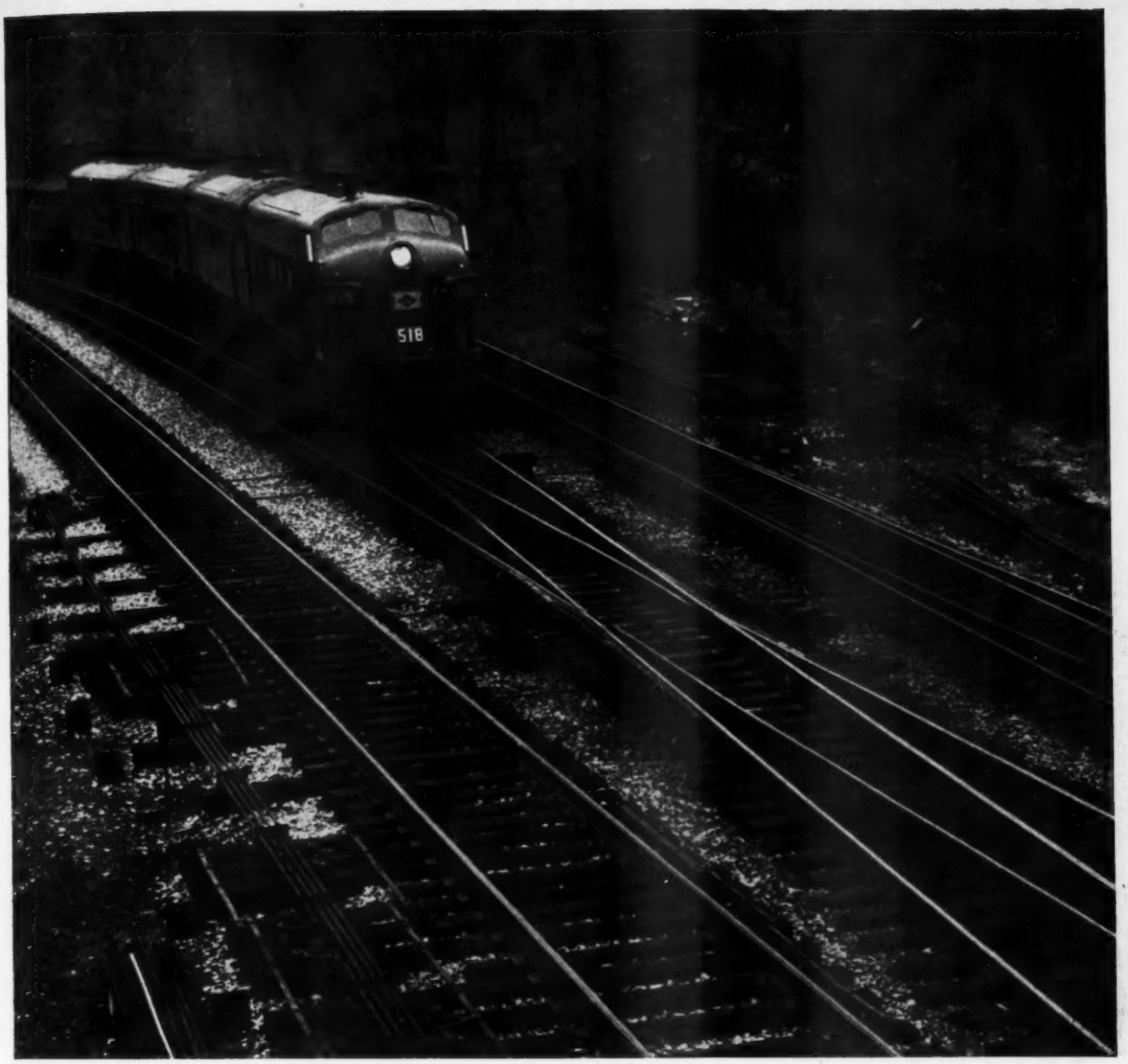
Mechanized TIE RENEWAL and RAISING Gang

FORCE	PRODUCTION
1 Foreman	1000 feet/hour of Working Time
2 Assistant Foremen	100 ties/hour of Working Time
8 Machine Operators	(Based on Monthly Average)
14 Laborers-Flagmen	
25 Total Force	

Railway Maintenance Corporation

PITTSBURGH 30, PA.

Designers and manufacturers of: McWilliams Mole, Super Mole . . . McWilliams Tie Tamper, Crib Cleaner, Ballast Distributor . . . TieMaster . . . LineMaster . . . SpikeMaster



Why this crossing was heat-treated

Movable-point crossings involve a substantial investment, and this one takes quite a pounding from the heavy-duty main line traffic. So the railroad's engineers specified Bethlehem heat-treatment to obtain substantial improvement in toughness, yield point and hardness. Thus they can expect this crossing to render many extra years of dependable service in this heavy-duty assignment, with minimum maintenance expense.

If you have a trackwork project which might benefit from heat-treatment, turn it over to Bethlehem. We can handle heat-treatment of any rail or track component up to 60 ft in length. And we have the accumulated knowledge and experience of more than 60 years of rail-steel production and nearly 30 years in the heat-treatment of rail. It will pay you to discuss your project with us. Just call our nearest sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Published monthly by Simmons-Boardman Publishing Corporation, Emmett Street, Bristol, Connecticut, with editorial and executive offices at 79 West Monroe Street, Chicago 3, Illinois; 30 Church Street, New York 7, New York. Subscription prices: to railroad employees only in the United States and Possessions, and Canada, one year $2.00; $3.00 for two years. Single copy 50 cents. Entered as second class matter at the Post Office at Bristol, Conn., November 26, 1954, under act of March 3, 1879. Volume 51, No. 9.

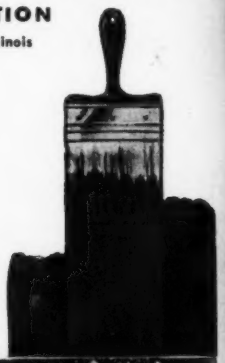
RUST-OLEUM lasts longer
...applied directly over rusted surfaces!

STOP RUST! with RUST-OLEUM

The Practical, Sensible Answer To Your Rust Problems!

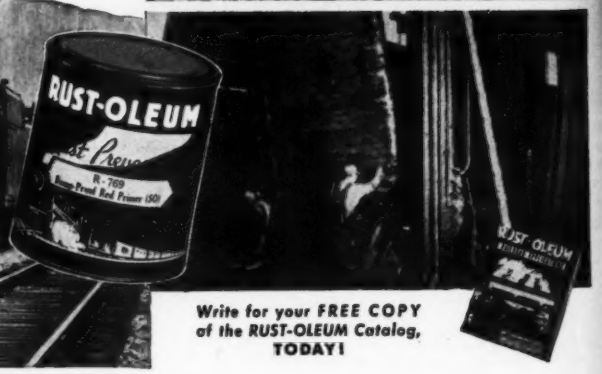
Here's what RUST-OLEUM can do for you: (1) Cut your maintenance costs by saving you time, labor and money . . . because RUST-OLEUM may be *applied directly over rusted surfaces* by brush, dip or spray after wirebrushing and scraping with sharp scrapers to remove rust scale and loose rust! Costly sandblasting and chemical pre-cleaning are not usually required. (2) RUST-OLEUM *lasts longer* applied over surfaces already rusted. (3) RUST-OLEUM'S tough, elastic, rust-resisting film protects signal equipment, rolling stock, towers, bridges, metal buildings and all rustable metal surfaces. Get the complete story from a RUST-OLEUM Railroad Rust Preventive Specialist! See why major railroads throughout the nation rely on RUST-OLEUM.

RUST-OLEUM CORPORATION
2550 Oakton Street • Evanston, Illinois

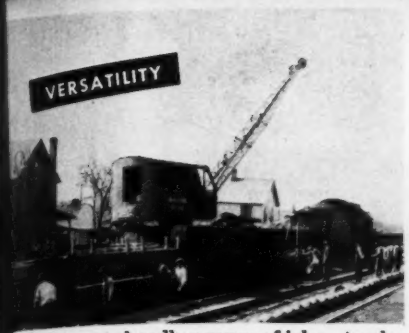


May be applied directly over rust

Available in all colors, Aluminum and White



Write for your **FREE COPY** *of the* **RUST-OLEUM** *Catalog,* **TODAY!**



Northwests handle a range of jobs a track type rig can't handle! Crawler mounted Northwests are easily loaded on one standard flatcar and unloaded under their own power or they can be put on the job over the highway by truck or trailer.

They will handle any type of excavation or material handling within their capacity. Many Class I Railroads are using them for a wide range of work including bank trimming, ditching, building shoulders, storeyards, etc.

Northwest Truck Cranes get over the road quickly. They bring you a combination of advantages that make them superior to other similar equipment.

WHAT IS GOING TO

CUT YOUR MAINTENANCE

COSTS THE MOST?

Your Northwest is easily handled. "Feather-Touch" Clutch Control assures ease of operation mechanically and without the complications of pumps, compressors, rams and other delicate equipment that could shut a machine down.

Northwest Crawlers with their self-cleaning action take them where other machines have difficulty. They have been proved in miles of ditching and drainage work.

Your Northwest will work either from the car or on the ground and can be equipped with piledriver, magnet, tie grapple, clamshell, tongs, dragline bucket, pipe hook, book block, etc.

Northwest versatility in handling a wide range of boom lengths is well known. You have, too, a wide selection of boom hoist equipment. One, two or three load lines, independent operation, live boom—a combination for every need.

If you need reach Northwest can give it to you—long booms with jibs for those pole and bridge jobs.

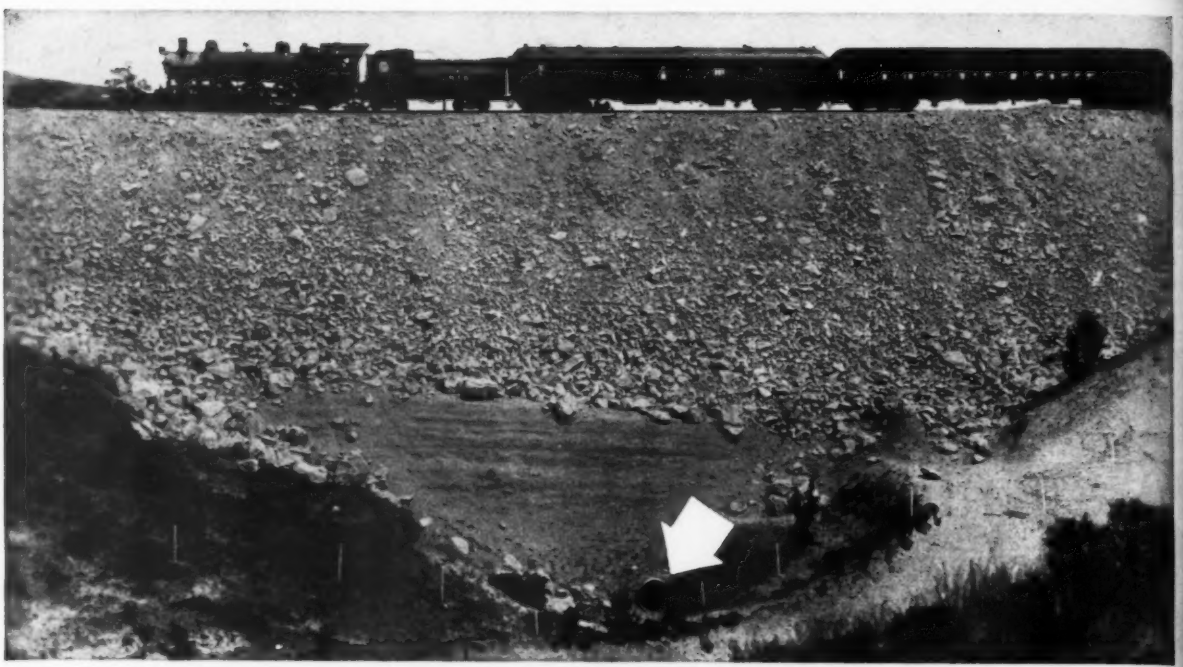
All Northwests can be converted from a Crane to a Dragline, Standard Shovel or Pullshovel, to give you maximum efficiency for handling your problems.

NORTHWEST ENGINEERING COMPANY

1513 Field Building • 135 South La Salle Street • Chicago 3, Illinois

NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
CRAWLER OR RUBBER MOUNTED SHOVELS
CRANES • DRAGLINES • PULLSHOVELS



After 27 Years Under High Fill

...THIS CULVERT ALIGNMENT LIKE NEW

This 60-inch Armco Corrugated Metal Pipe safely withstands the tremendous dead load of 77 feet of fill. The 8-gage structure was installed by the Union Pacific Railroad in Wyoming during 1928.

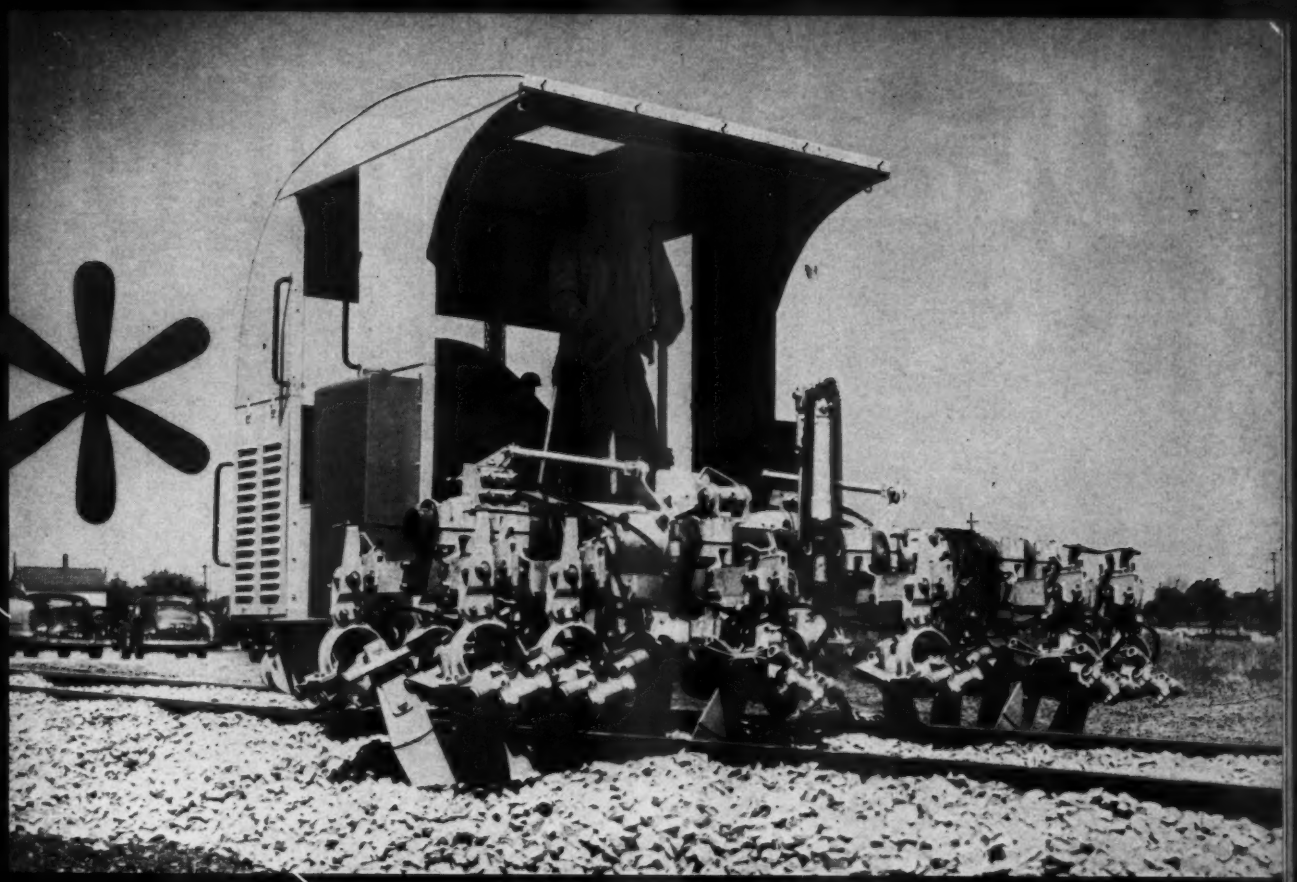
Picture above taken shortly after installation, shows the Armco Pipe (arrow) dwarfed by the fill. The interior view, taken during a 1953 inspection, reveals the continuing good alignment and material condition.

With Armco Structures, soil movement and frost action are no threat to alignment. Simple, bolted coupling bands between long, 20-foot sections of Armco Pipe assure strong, tight joints. In addition, Armco Drainage Structures have the flexible strength of corrugated metal design—your assurance against cracking and breaking under loads.

Write us for details. There's a size and type of Armco Structure for almost every drainage need. Armco Drainage & Metal Products, Inc., 4695 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO CORRUGATED METAL DRAINAGE STRUCTURES

ARMCO



MULTIPLE TAMPER

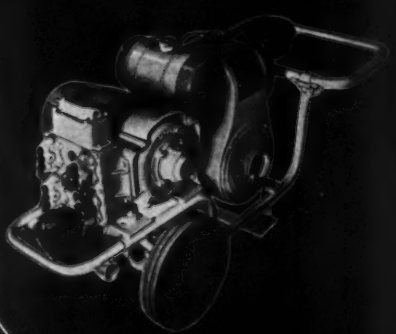
FOR 1956

Unsurpassed for putting up track of finest uniform quality in any lift from moderately low to high. Initial cost is far less than any other on-track tamper.

JACKSON HAND TAMPERS and POWER PLANTS

are ideal for low lift and smoothing work with small gangs using 2 to 4 tampers — excellent for major ballasting or out-of-face operations since 2 or more outfits may be grouped as required. Quickly interchangeable blades make them extremely versatile and efficient on every type of application.

Model M-22 Power Plant serves 2 to 4 tampers, is thoroughly reliable, easily portable. Also serves well for lighting, emergency signaling and operating other power tools.



MFD. BY JACKSON VIBRATORS INC. LUDINGTON, MICH.

LUDINGTON, MICHIGAN

Quality Trackwork

UNITED STATES STEEL

k on the job by U.S. Steel

● This main line turnout on the Union Railroad is located at the Duquesne, Pa., yards. It includes the following quality Trackwork products, manufactured by U. S. Steel:

- A 16'-6" insulated rigid split switch.
- TAYLOR Adjustable Rail Braces laterally bracing the stock rails.
- A USS No. 140M parallel-throw Switch Stand.
- A Rail Bound Manganese Steel Frog, with guard rails placed opposite.

USS Quality Trackwork products possess an inherent strength and hardness that gives them longer life and results in greatly reduced maintenance. The extra care and effort that goes into the manufacture of joint bars, tie plates, switches, frogs and special track layouts makes USS Trackwork the finest you can buy. Specify USS Quality Trackwork for all your requirements. Write to United States Steel Corporation, 525 William Penn Place, Room 4887, Pittsburgh 30, Pa., for data on any of the above products or assistance in design from our engineers.

USS

TRACKWORK

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

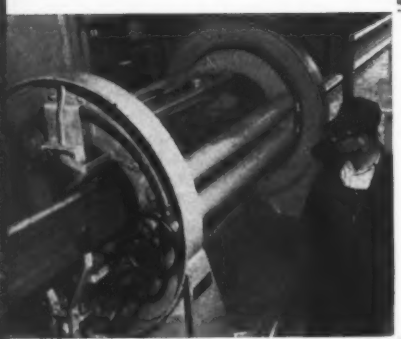
SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

Matisa

Does More Than Maintain Track . . . It IMPROVES IT!

Mere maintenance is not enough today. Matisa's *new services* and *modern* machines go beyond that by creating track so smooth it *stimulates good public relations.*

After the weld is made and the upset is sheared off, the rail is moved into a second Matisa car where this grinder smooths up the sheared base of the rail.



After base grinding, the rail moves to this machine in the same car where the rail-head contour is ground. In addition to the grinding machines, this car contains a winch for moving the long rail and a monorail and hoist for handling the rail clamp.

After each weld has been accepted by the railroad, the welded rail moves on rollers out of the prefabricated shed in the foreground onto flatcars. When loaded, these cars of quarter-mile lengths of rail are hauled as a train to the rail-laying site.

THE *Matisa* FLASH RAIL WELDER

Here is the complete mobile welding shop you've been reading about. In the photo above, rails have been "threaded" into the electric welding machine and ends are being FLASH-WELDED together. Succeeding steps are shown in the photos at the left.

The Matisa FLASH RAIL WELDER is but one example of the numerous "new design — new technique — modern machine" advances Matisa has contributed *to improve* track, not merely maintain it. The Matisa Selective-Depth Tamper and under-the-tie, "complete" Ballast Cleaner are other examples of Matisa equipment which makes track and roadbed *better* than ever, not merely "maintained" as good as they were.

With a keen appreciation of public interest, the Santa Fe uses advertising to tell the public what it's doing to *improve* its track. Continuous rail, welded by the new Matisa FLASH welding process inspired a recent ad which told . . .

how the **Santa Fe** is creating "AMERICA'S NEW RAILROAD"

Matisa EQUIPMENT CORPORATION

1020 Washington Ave. Chicago Heights, Illinois

TRACKWORK SPECIALISTS ALL OVER THE WORLD

News Notes

. . . a resumé of current events throughout the railroad world

RAILWAY

TRACK and STRUCTURES

SEPTEMBER, 1955

Estimated net income for Class I roads for the first six months of 1955 was up $184,000,000, after interest and rentals, from last year. The six-month figure this year was $416,000,000 compared with $232,000,000 in the corresponding period of 1954.

•

Close scrutiny is being given to the management organization on more than one railroad of substantial size, with an eye to improvement. The "let's take a look" attitude stems from the realization that it takes more than able men to run a railroad with maximum efficiency—it takes effective organization too.

•

With every purchase of a roundtrip ticket to Los Angeles from any point on its system, the Santa Fe is giving a 5 per cent discount certificate for use in renting a Hertz automobile in the Los Angeles area. Purpose of the move is to provide travelers with a complete round-trip discount on all transportation by matching for car rentals the saving available on a round-trip ticket.

•

The 11 non-operation unions now want an increase of 25 cents an hour, "across the board", from the nation's major carriers. In their latest demand, the unions say they are merely "keeping pace" with wage increases in other industries. Effective date would be September 1.

•

Wage increases ranging from 50 cents to upwards of $1.63 per day for yard-service enginemen who convert from a 6-day, 48-hour week to a 5-day, 40-hour week, have been recommended by a Presidential emergency board. The Brotherhood of Locomotive Firemen & Enginemen had asked that the conversion raise be increased by $2.24 per day. The board recommended that the BLFE demand for guaranteed minimum of $18 per day for firemen and $20 per day for engineers, respectively, be withdrawn.

•

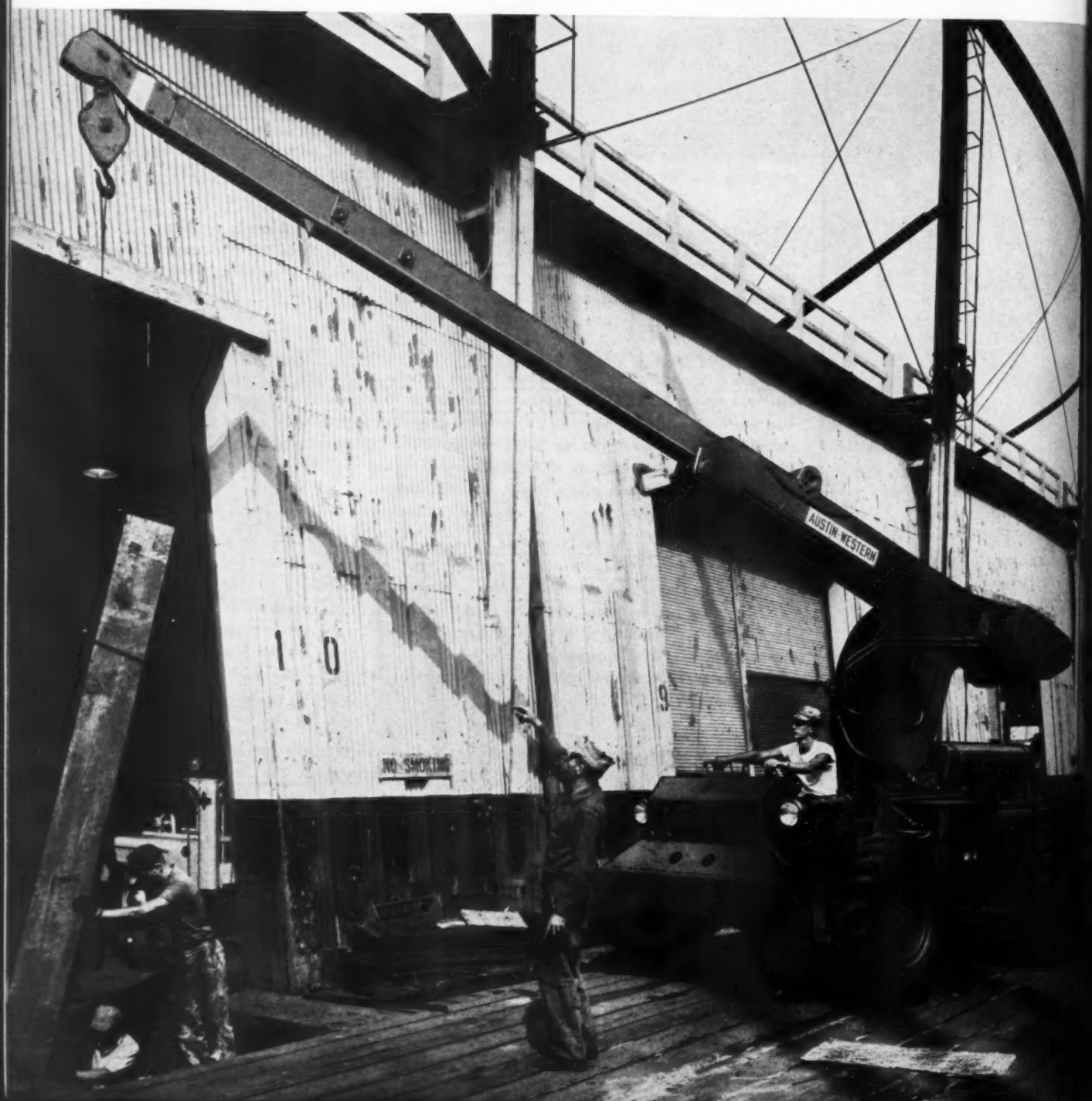
The Nebraska Supreme Court has ruled that the U. S. Congress was without authority to impose the so-called "closed shop" provision of the 1951 amendment to the Railway Labor Act upon employees of railroads in that state. In handing down its opinion, the court said, "We think the freedom of association, the freedom to join or not in association with others for whatever purposes such association is lawfully organized, is a freedom guaranteed by the First Amendment. We also think the right to work is one of the most precious liberties that man possesses . . ."

•

Two new yard expansion and modernization projects are expected to get underway this fall. One on the Southern Pacific at Eugene, Ore., calls for installation of a gravity-type yard with radar controls, automatic switching and floodlighting for around-the-clock operation. The project is expected to cost $5,750,000, and will increase the present 2,000-car-per-day capacity of the yard by an expected 1,500 cars. The other project, on the Milwaukee, will convert the road's "Pig's Eye" yard at St. Paul from flat switching to automatic retarder operation with speed control. In addition to re-arranged trackage, the latter project will include new freight-car repair facilities and new icing facilities. Modern signaling and communications also will be installed. Cost is estimated at $5,000,000.

AUSTIN-WESTERN HYDRAULIC CRANE

Doubles Production



on Western Maryland

A-W Crane "a Six-Man Gang"

Says F. C. Etchison, Chief Engineer

Western Maryland Railway Company
Baltimore, Maryland

REPLACING OLD TIMBERS

"On this 900-foot pier and warehouse with two tracks down the center, the men are sawing off piles, lifting out 12" by 12" and 8" by 16" timbers, replacing them with new material."

"With this Austin-Western Hydraulic Crane, a five-man gang and its foreman can do twice the work in the same time and do it easier."

"...without the Crane, our schedule would have been disrupted and delayed."

VERSATILE TOOL

"Over 1,000 feet of pipe was torn out in two days with one gang — a job that would have taken at least four days without this hydraulic helper..."

"It has four-wheel drive and both front and rear wheels are steerable. The oversized rubber tires climb over rails with ease, yet provide a smooth ride on level surfaces."

"It unloads flat cars of new material and then loads waste material on the cars for transport to Hagerstown for salvage or burning."

"It handles rails and other track materials."

"We recently set a 1,000-gallon fuel storage tank underground, and we often pick up and move small buildings."

"It hangs 20′ x 15′ metal doors in two hours, which used to require approximately four hours."

COSTS LESS

"With the daily cost of owning and operating our A-W Hydraulic Crane less than one hour's payroll of our foreman and his five men, this handy tool actually doubles production of the six men, and the men, of course, are saved many hours of back-straining labor."

Get the complete story as reported by Mr. F. C. Etchison to the H. P. Gould Company today. Ask your dealer for a copy or mail the coupon below.

AUSTIN-WESTERN COMPANY

Construction Equipment Division · Baldwin-Lima-Hamilton Corporation

AURORA, ILLINOIS, U.S.A.

Power Graders • Motor Sweepers

Road Rollers • Hydraulic Cranes

AUSTIN-WESTERN COMPANY
642 Farnsworth Avenue, Aurora, Illinois
Please send complete Gould Certified Report N. 5986.

Name.....

Title.....

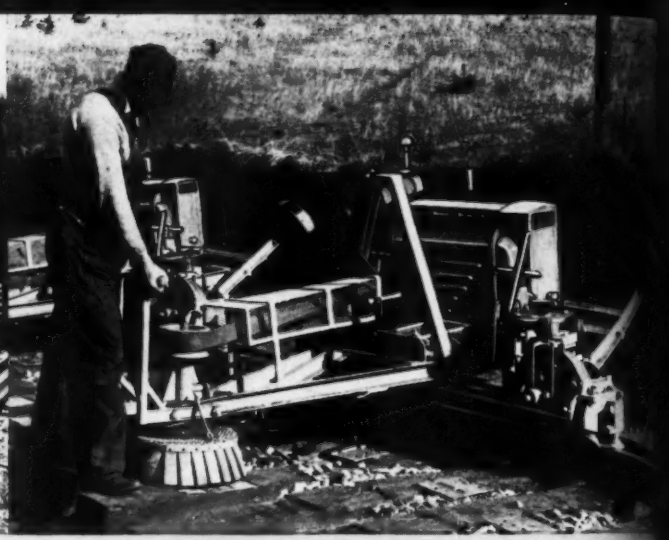
Company.....

Street.....

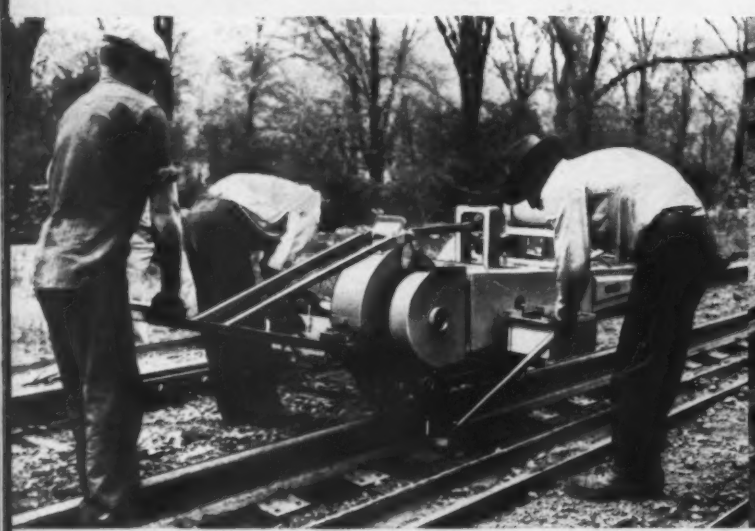
City..... Zone..... State.....

Here's the best way to get both *QUALITY and SPEED*...use these NORDBERG *"Mechanical Muscles"*® on your relaying operations

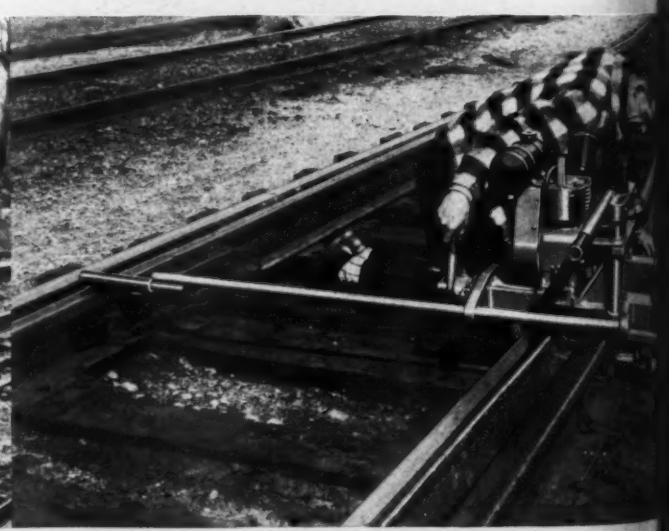
BALLAST ROUTER . . . For removing high crib ballast which would interfere with the operation of adzers in rail renewal operations. Cuts a flat trench, the depth of which can be set by an adjustable stop, and also sweeps the area of the tie to be adzed.



ADZING MACHINE . . . Operated by one man, this adzer prepares tie seats in keeping with today's maintenance standards, all level and in same plane. Machine is readily adjusted for various rail heights and can quickly be set on or off track.

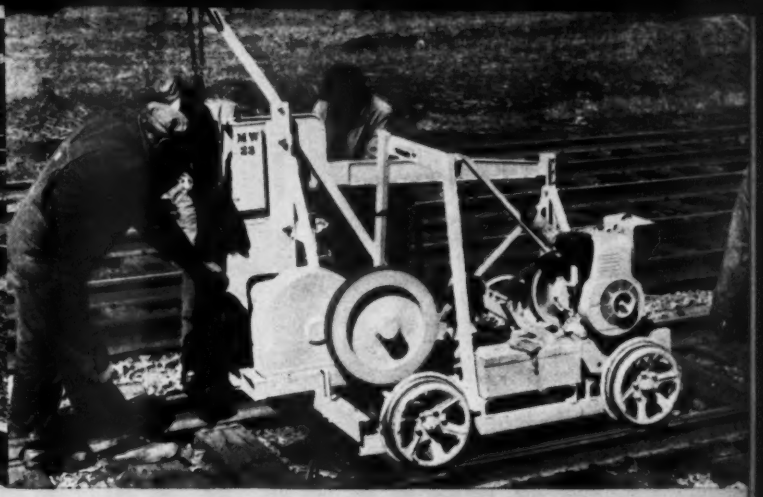


SPIKE PULLER . . . Operated by three men, this machine will pull from 30 to 45 spikes per minute. Through a simple mechanical hook-up, an upward pull in excess of 12,000 lbs. is exerted through the spike tongs.

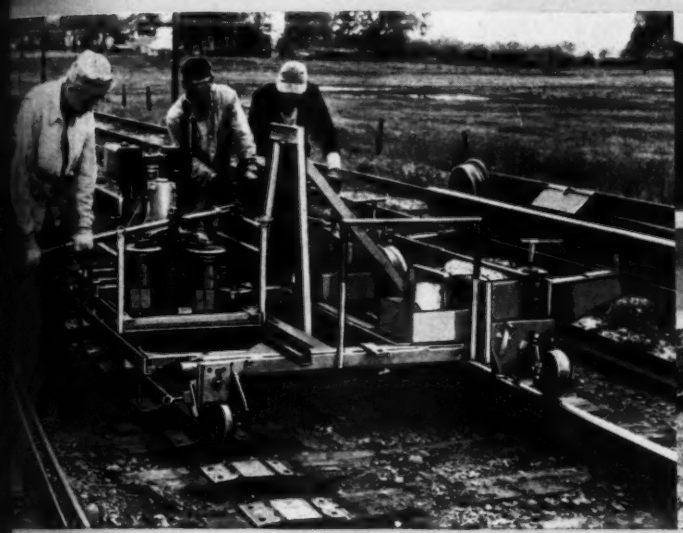


RAIL DRILL . . . This lightweight, compact, easily adjusted drill is remarkably efficient, is quickly set up, easily operated and moved from job to job. Self tightening chuck is simple and the bit is positively held.

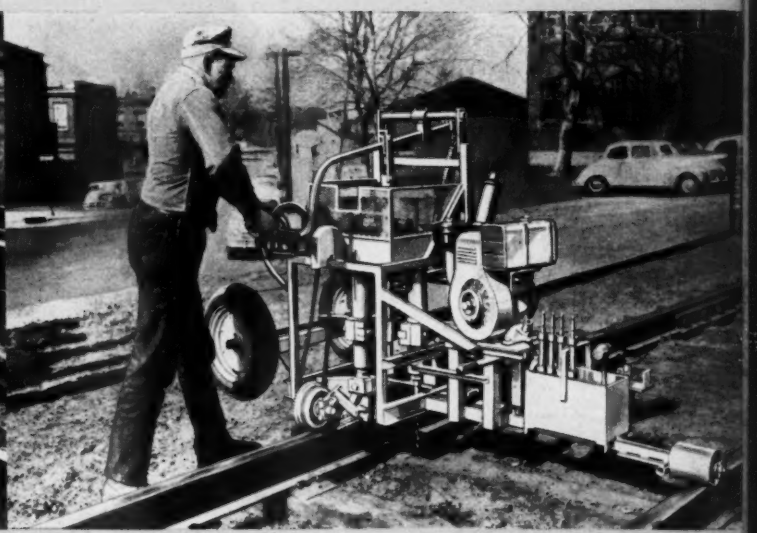
POWER WRENCH . . . Ruggedly built to stand up under the most severe service, yet is light in weight to be easily handled off or on the track. Manned by one operator, it is a speedy tool that provides uniformly controlled tightening of track bolts.



SPIKE HAMMER . . . A self-contained machine providing fast easy method for driving spikes straight and vertical. With this machine, a properly organized crew can drive about 800 spikes per hour, 400 on either side of the rail.



DUN-RITE® GAGING MACHINE . . . Follows right behind the adzers and fastens the tie plates to the ties in exact position, so that when the rail is placed the head-to-head gage is correct. The Dun-Rite method is base gaging and it is actually the outside shoulder of the tie plate which is gaged.



TIE DRILL . . . Drills two holes at once and is by far the fastest tie drill on the market. Operated entirely by one man who can spot and drill 48 holes in the 24 ties of one rail length in just 2½ minutes for rail holding or plate fastening spikes.

NORDBERG Track Maintenance Machinery improves quality and increases speed in rail relaying operations. With these efficient "Mechanical Muscles" in your rail gang, you do the job right the *first time*—eliminating costly back-up work—and end up with top quality representing important savings in maintenance time and money.

These eight Nordberg Maintenance Machines, from the Power Wrench on through the Rail Drill, are part of the full line of "Mechanical Muscles" that has been designed, built, and proved in use with the cooperation of track maintenance men. This equipment actually revolutionized maintenance methods in scores of operations for the Nation's railroads. Most important, experience proved that maintenance operations can be done *better, faster* and at *lower cost* . . . through the use of Nordberg "Mechanical Muscles."

Write for literature describing any or all of the full line of modern, money-saving Nordberg Track Maintenance Machinery for meeting today's maintenance needs.

NORDBERG
"Mechanical Muscles"®

© 1955, Nordberg Mfg. Co.

R1155

ADZING MACHINE • BALLAST ROUTER • CRIBEX® • BALLASTEX® • SCREENEX® • HYDRAULIC and MECHANICAL SPIKE PULLERS • SPIKE HAMMER • TIE DRILL • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • TRACK SHIFTER • DSL® YARD CLEANER • TRAKLINER • GANG TAMPER • DUN-RITE® GAGING MACHINE • GANDY—TIE PULLER and INSERTER

NORDBERG MFG. CO., *Milwaukee, Wis.*

NORDBERG MACHINERY

Santa Fe adopts

136 CF&I 1360 RAIL

Height		7-5/16"
Head	Depth	1-15/16"
	Width	2-15/16"

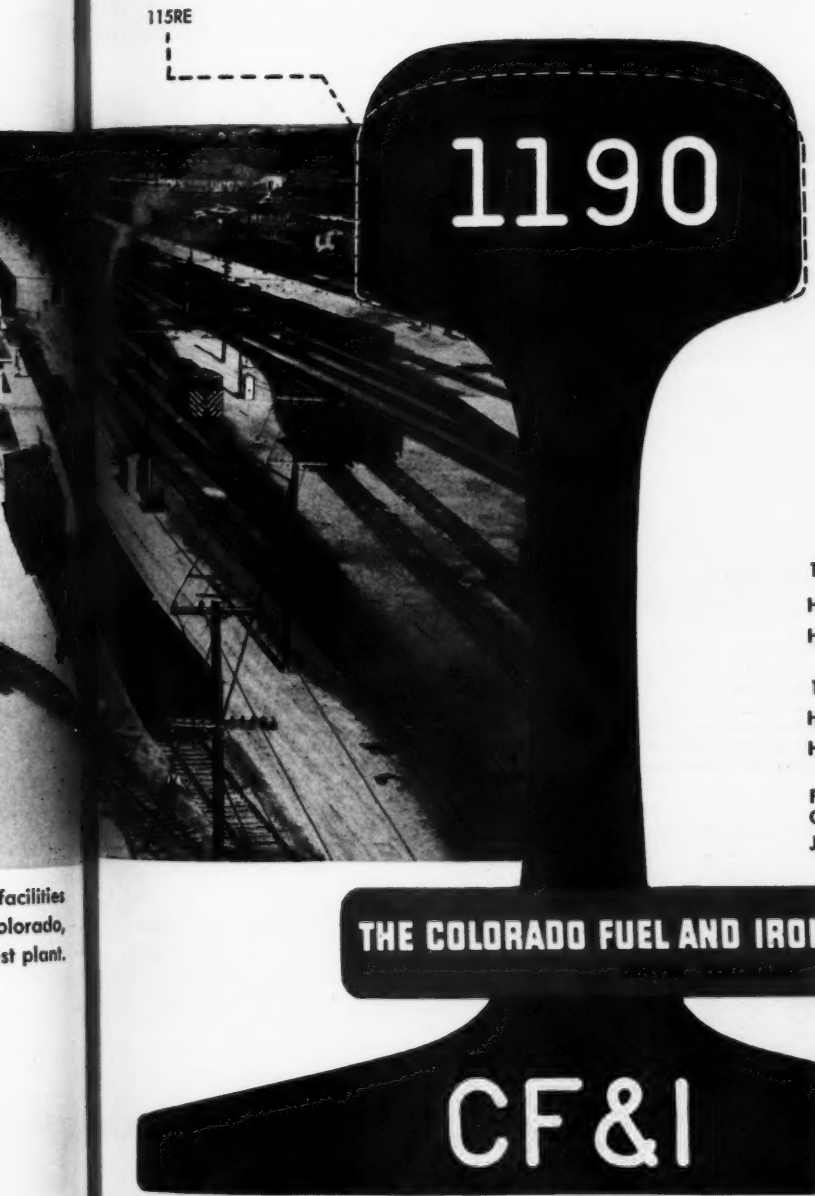
132RE

Height		7-1/8"
Head	Depth	1-3/4"
	Width	3"

Fishing and Base Dimensions of 136 CF&I and 132RE are identical.
JOINTS FOR 136 ALSO FIT 132RE.

New Hump Yard and modern terminal facilities serving the fast growing city of Pueblo, Colorado, and expanding operations of CF&I's largest plant.

new RAIL SECTIONS



"America's New Railroad," ever alert to new processes, new methods, and improved means of achieving highest quality performance, to assure its freight and passenger traffic a smoother, safer, and better track structure, adopted as its standard the new CF&I 136 pound and 119 pound rail sections first produced at the Pueblo Rail Mill.

CF&I is proud to thus contribute to Santa Fe's record of continued betterment.

119 CF&I 1190 RAIL

Height		6-13/16"
Head	Depth	1-7/8"
	Width	2-21/32"

115RE

Height		6-5/8"
Head	Depth	1-11/16"
	Width	2-23/32"

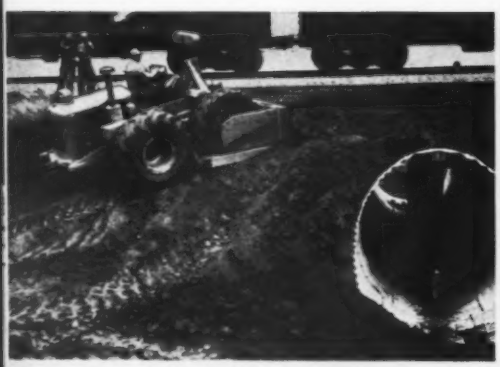
Fishing and Base Dimensions of 119 · CF&I and 115RE are identical.
JOINTS FOR 119 ALSO FIT 115RE.

3324

Tournatractor crosses tracks without blocking, does no damage to rails or switches. Big, low-pressure tires deflect to move load evenly over obstructions . . . do not chamfer ties, trip or damage block signals.

Tournatractor travels between jobs along right-of-way, cross-country, or over paved highway at speeds to 19 mph. A phone call is all it takes to get this "one-man work crew" in motion.

RUNS to maintenance jobs



BACKFILLS CULVERTS

This is typical of the jobs that Tournatractor can handle without the help of other equipment. When mainliner barrels through, 186 hp tractor-on-rubber pulls to one side . . . minutes later is working again. No delaying of traffic . . . no moving of work train onto siding . . . no idle track gang.

STOCKPILES COAL

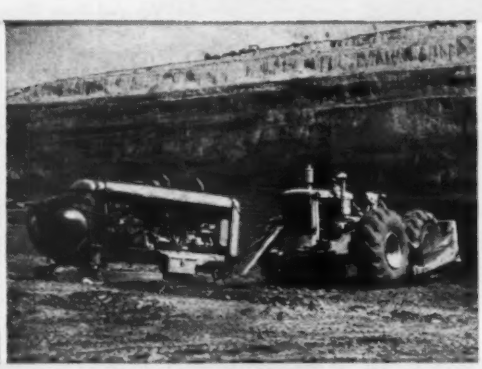
With dozer blade or scraper, 19 mph Tournatractor stockpiles coal, cinders, or ballast. Low-pressure tires compact and seal coal-pile against fire . . . do not grind coal into fines like tracks. Its 4 tires do a better job of compaction than crawler's 550 track parts . . . yet have less maintenance.

CLEARS LANDSLIDES

A minute after emergency occurs, Tournatractor h[as] the way. Dozing in 2nd gear (3.7 mph) and [back]ing up at 8 mph, Tournatractor makes short [work] a rock slide like this. As a result, trains [can] sume schedules faster . . . tracks are not [blo]cked by work train. No planking is necessary.

PUSH-LOADS SCRAPERS

Teamed with Tournapulls on 800,000-yd. rail spur line in Montana, this Tournatractor pushed 42 loads of sand an hour. Load distance for 9½ cu. yds. averaged 75' . . . load time, 30 seconds. Torque converter enables Tournatractor to match scraper speed for fast, efficient loading.



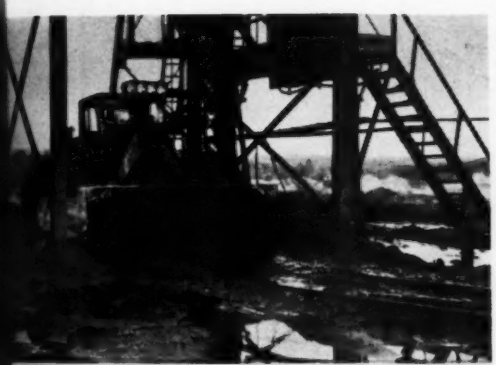
PULLS HEAVY EQUIPMENT

Skidding heavy compressor is one of many pulling jobs your Tournatractor can handle. 186 hp diesel and 4-wheel drive give plenty of drawbar pull to handle heavy loads. Unit pulls scrapers, tows Rooters, pulls trailers, skids generator plants, poles, ties, assists stalled trucks, etc.

SPOTS RAILROAD CARS

Powerful Tournatractor spots cars in emerg[ency] . . . keeps sidings clear for incoming freight, [in]stant-shift gear selection keeps unit pushing wi[th]out losing vital momentum. Unit straddles rails [with] room to spare. Tournatractor can also assist d[e]railed cars back onto track.

bs anywhere in your division



CLEANS UP YARD

Big blade, 186 hp "push", instant gear change, plus 8 mph reverse, enable tractor to outwork any big crawler. Unit generates own electricity for raising and lowering blade, and operating towed equipment. 3-yd. Angledozer can be mounted in place of 2½-yd. Bulldozer.

PLOWS SNOW

Tournatractor V-type snow plow clears path 12'3" wide. Vertical center divider plate cuts frozen drifts, eliminates plowing snow back on road when widening. Big low-pressure tires, adjustable runner-shoe protect plowed surface. Electric-controlled wing for benching is available.

Do your scattered earthmoving jobs faster and cheaper with one man and a rubber-tired Tournatractor!

No need to get a work train ready. No time-consuming loading and unloading of equipment. No waiting for dispatchers and a clear track. Operator just hops on and goes — over tracks, pavement, bridges, along right-of-way, or highway. Averages a mile every 3 or 4 minutes.

Once on a job, Tournatractor gets right to work. When dozing, it delivers 2½ yds. every few seconds. It also pulls equipment speedily, uproots trees, brush, cuts slopes, etc. Because of its greater speeds, it will outwork the biggest crawler-tractor on almost every assignment, 2 or 3 to 1. It has 4-wheel drive, instant gear change with constant-mesh transmission, torque converter, powerful 4-wheel disc-type air brakes, and fast finger-tip electric control. It's easy to operate, handy to maneuver, safe and dependable, needs little maintenance. It gets work done fast without delays to rail traffic. And it goes from job to job in a hurry!

Let us show you just what 19 mph Tournatractor can mean to you in better maintenance for less money!

Tournatractor, Tournapull, Angledozer, Rooter—Trademarks Reg. U.S. Pat. Off. Tournatractor—Trademark T-643-RB

FREE . . . "The Railroad Handyman"

20-page book shows how 7-yd. self-loading D Tournapull cuts time and costs o right-of-way maintenance. Send coupon for your free copy. No obligation.

Name ..... Title .....

Railroad .....

Address .....

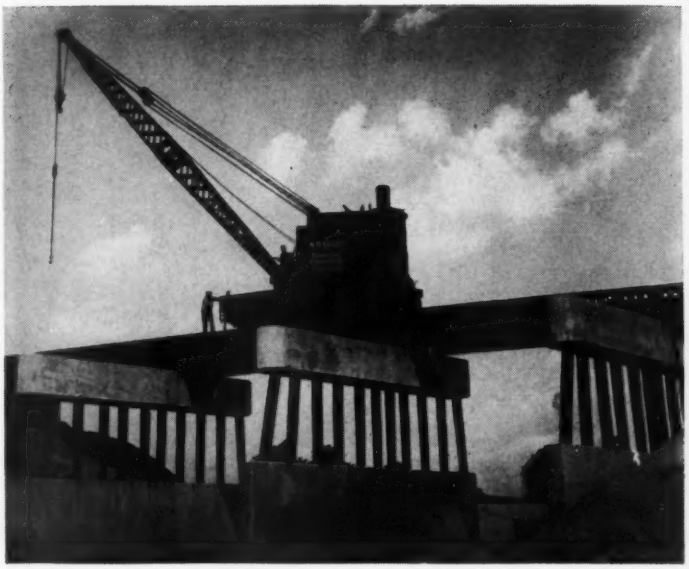
LeTourneau-Westinghouse Company

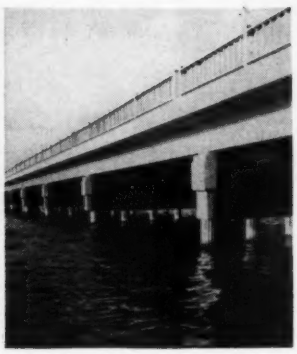
PEORIA LT ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WITH Monotube Foundation Piles

...BIG SAVINGS IN BRIDGE CONSTRUCTION





WHEN you specify Monotube foundation piles for highway or railroad bridge construction . . . jobs go faster, costs stay low.

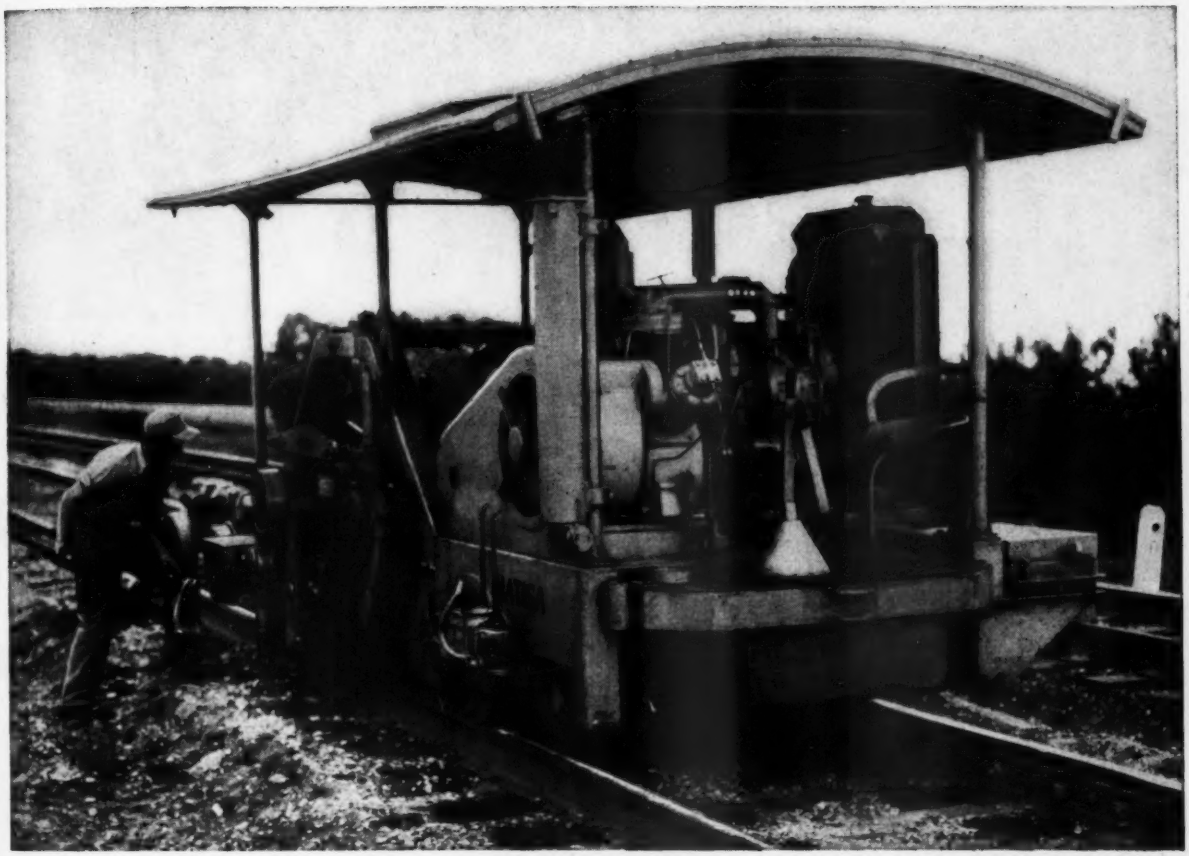
The tapered, fluted design of steel Monotube piles means faster driving. Monotubes are easier to handle and transport because of rigid, light weight construction. There's no need for special rigs or heavy driving equipment.

With a simple, single weld, Monotubes are readily extended to any required length, right on-the-job. Cut-offs can be used as extensions to eliminate waste. Monotubes are cold-rolled for added strength and long life.

Before starting that next foundation job, whatever or wherever it may be, remember, Monotube piles offer you specific advantages that pay off in sound construction and unusual economy. Write today for your copy of Catalog No. 81. Address The Union Metal Manufacturing Company, Canton 5, Ohio.

Monotube Foundation Piles

UNION METAL



This ballast cleaning machine is one of many different types of track maintenance equipment being lubricated with Esso Multi-Purpose Grease.

Esso Multi-Purpose Grease simplifies Track and Machinery Maintenance

THE WIDE ACCEPTANCE of Esso Multi-Purpose Grease is due to these important reasons:

1 *It eliminates the need for a variety of greases. ONE grease serves many purposes, preventing the application of the wrong grease and possible damage to machines.*

2 *It is easier to protect a single container of Esso Multi-Purpose Grease from contamination than several partially empty special-purpose drums.*

3 *Storage and handling problems are reduced to a minimum resulting in additional economy.*

Esso Multi-Purpose Grease is ideally suited for maintenance-of-way equipment such as ballast cleaners, tampers, cribbers, screeners and many other pieces of machinery, including automotive and construction equipment.

ESSO OFFERS A COMPLETE LINE OF DEPENDABLE RAILROAD PRODUCTS

Readily available throughout the Esso Marketing Territory are these high quality railroad products . . . famous for outstanding performance on the job . . . backed by continual testing on the road and in the lab.

*Esso Gasolines
*Diesel Fuels
ESSO ANDOK Lubricants—versatile greases
ARACAR—journal box oils
ARAPEN—brake cylinder lubricant
*ESSO XP Compound—hypoid gear lubricant
*ESSOLUBE HD—Crankcase Oils
DIOL RD—Diesel lube oil
COBLAX—tractor motor gear lube
*VARSOL—Stoddard Solvent
SOLVESSO—Aromatic solvent
*ESSO Weed Killer
ESSO Hotbox Compound
*AROX—pneumatic tool lube
*ESSTIC—Hydraulic Oil
*Asphalt
*Cutting Oils
*Rail Joint Compounds
*Signal Department Products
*RUST-BAN—corrosion preventive

*Denotes product used for maintenance-of-way equipment

ESSO

RAILROAD PRODUCTS

SOLD IN: Maine, N. H., Vt., Mass., R. I., Conn., N. Y., N. J., Pa., Del., Md., D. C., Va., W. Va., N. C., S. C., Tenn., Ark., La.

ESSO STANDARD OIL COMPANY — Boston, Mass. — Pelham, N. Y. — Elizabeth, N. J. — Bala-Cynwyd, Pa. — Baltimore, Md. — Richmond, Va. — Charlotte, N. C. — Columbia, S. C. — Memphis, Tenn. — New Orleans, La.

BALLAST REGULATOR, SCARIFIER & PLOW

Does Work Of 10 To 30 Men—Monthly Rental $350

Used for 14 different operations in ballast scarifying, cleaning, rebal-lasting, resurfacing, retimbering and maintenance of ballast shoulder

JACKALL

Does Work Of 6 Men—Monthly Rental $277

Used in track surfacing gangs. Takes place of all hand jacks normally used in raising track

HYDRAULIC JACKS

Does Work Of 4 Men—Monthly Rental $129

Used for raising track in resurfacing programs.

SPOT TAMPER

Does Work of 8 Men—Monthly Rental $750

Used with an operator, foreman and two laborers for spot surfacing.

TRACK CRANE

Does Work Of 6 Men—Monthly Rental $129

Used for redistributing new ties for replacement, picking up old ties and with bridge gangs.

Kershaw

TESTED, PROVEN AND PURCH

THREE PLANS

All Kershaw machines are available under any one of the following three plans:

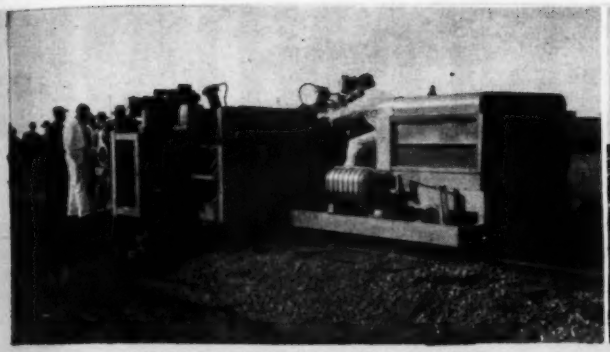
1 Three Year Lease—Lease Kershaw machines for three years. All rentals shown on these pages are based on this plan.

2 Six to 12 Months Rental With Option To Purchase—Lease a Kershaw machine for six to 12 months. Any time during that period you may purchase the machine with 90 per cent of rentals applying to the purchase price.

3 Outright Purchase.

Atlanta & St. Andrews Bay
**Atchison, Topeka & Santa Fe
**Atlantic Coast Line
Bessemer & Lake Erie
*Boston & Maine
**Estra de Ferro Central do Brazil
**Chesapeake & Ohio
*Canadian Pacific
****Canadian National
***Central of Georgia
Chicago & Eastern Illinois
Chicago Great Western
Clinchfield
*Chicago, Rock Island & Pacific
Con. R. R. of Cuba
Chicago, Milwaukee, St. Paul & Pacific
Chicago & North Western
Carolina & North Western
Delaware & Hudson
*Delaware, Lackawanna & Western
Detroit & Macinac
Duluth, South Shore & Atlantic
*Gulf, Mobile & Ohio
*Interstate
*Lehigh Valley
**Louisville & Nashville
***Nashville, Chattanooga & St. Louis
*New York, New Haven & Hartford
****Pennsylvania
*Reading
******Southern
*Texas & Pacific
*Toledo, Peoria & Western
*Texas & New Orleans
*St. Louis and San Francisco
*Wabash
Western Maryland
***Illinois Central
Chicago, Indianapolis & Louisville

HAVE *YOU* INVESTIGATED KERSHAW *TRY and BUY*



UNDERCUTTER AND SKELETONIZER

Does Work Of 50 Men—Monthly Rental $1,100

Used for skeletonizing when track is raised and as undercutter to lower existing track.

BALLAST CLEANER & DISTRIBUTOR

Does Work Of 30 Men—Monthly Rental $1,100

Used for cleaning ballast removed by Undercutter, cleaning shoulder ballast, and for picking up ballast from shoulder and placing in track for surfacing.

TRACKWORK MACHINES

USED BY THESE RAILROADS

*Norfolk & Western
*Seaboard
Florida East Coast
IGN & GCL
*Atlanta & West Point
Chicago, Burlington & Quincy
*Richmond, Fredericksburg & Potomac
Genesee & Wyoming
Delaware & Hudson
Central Vermont
Lehigh & Hudson River
Fernwood, Columbia & Gulf
Bangor & Aroostook
****Northern Pacific
*Missouri Pacific
*Southern Pacific
Bailes-Sey Contractors
Ferguson & Edmondson
L. E. Pilot Co.
*W. H. Nichols Co.
*Phelps-Dodge Corp
Royce Kershaw Co., Inc
*T. F. Scholes, Inc
*Wm. A. Smith Construction Co
A. S. Wickstrom Construction So
*United Plastics, Ltd
Woodward Iron Co
*Corps of Engineers, U S Army
Kennecott Copper Corp
*Mannix Ltd.
San Manuel Copper Co

ADDITIONAL SALES PAST SIX MONTHS NOT SHOWN IN TABLE AT LEFT!

*Canadian Pacific
Chicago & North Western
*Deleware & Hudson
& Western
Deleware Lackawanna
*Detroit & Mackinac
*Lehigh Valley
Pennsylvania
***Southern
*Texas & Pacific
Texas & New Orleans
*St. Louis & San Francisco
Western Maryland
*Seaboard
*Southern Pacific
*Corps of Engineers U. S. Army
Nickel Plate
**Baltimore & Ohio
*Detroit Toledo & Ironton
*Elgin Joliet & Eastern
Missouri Kansas Texas
*Erie
**C. M. St. P. & P.
Union Railroad
*Central of Georgia
*Morrison Railway Supply
**Canadian National
*Central Railway of New Jersey
*Reading
Chesapeake & Ohio
Western Pacific
Birmingham Southern
Boston & Maine
U. S. Pipe & Foundry
Union Pacific
*D. R. G. & W.
*L. F. Pilot Co.

*2 to 5 Machines
**6 to 10 Machines
***11 to 20 Machines
****21 to 30 Machines
*****31 to 40 Machines
******41 to 50 Machines

KRIBBER

Does Work Of 10 Men—Monthly Rental $66

Used to crib between ties ahead of adzers; also for skeletonizing track.

TIE BED CLEANER

Does Work Of 4 Men—Monthly Rental $200

Used for scarifying and cleaning tie bed and for skeletonizing track.

TRACK BROOM

Does Work Of 10 To 15 Men—Monthly Rental $275

Sweeps cinders, slag, stone, ore and other car drippings onto conveyor, or places between track for loading into car or trucks. Also used to remove loose ballast between rail

THE PLAN?

KERSHAW MANUFACTURING CO. INC

MONTGOMERY, ALABAMA

PULLMAN-STANDARD

Pullman-Standard Power Cleaner and Winch Car Team—For the first time both track shoulders can be cleaned simultaneously at 1000 to 1200 feet per hour with only four men. Even in multiple track territory, the shoulder plus half the six-foot are cleaned to a depth of eight to ten inches below the tie base at the same high rate and with the same low labor complement. Your ballast cleaning costs can be reduced by as much as 50%.

Pullman-Standard Power Ballaster—With a production rate of 500 to 700 feet an hour, a Pullman-Standard Power Ballaster, run by a single operator, can be efficiently manned by a crew of 10 to 15 men. Case history studies made on 16 railroads prove that this unit will give more feet of finished tamped track per hour, with less labor and maintenance, than any other production tamper.

Pullman-Standard Power Cribb—The Pullman-Standard Power Tra Cribber gives you two cribs a mini with a single operator. With a norm production rate of 150 to 400 tra feet per hour, its interchangeable 4-, and 6-inch digger tips enable it to cr efficiently and economically in any ty of ballast, regardless of cementati

POWER CLEANER and winch car team

- distributes cleaned ballast wherever required
- cleans both shoulders at the same time
- works to a depth of eight to ten inches below tie base
- requires only one operator for each car and two laborers
- work rate is 1000 to 1200 ft. per hour
- forward or reverse running speeds of 25 mph
- power winch car develops up to 30,000 pounds of tractive force
- units have lateral set-off
- Each machine can be run independently or can tow the other

Be sure to get all of the facts about Pullman-Standard Power Track Maintenance Equipment. Write or phone the nearest office.

YOUR NEEDS CREATE THE PULLMAN "STANDARD"

PULLMAN-STANDARD

CAR MANUFACTURING COMPANY

SUBSIDIARY OF PULLMAN INCORPORATED

79 EAST ADAMS STREET, CHICAGO 3, ILLINOIS

BIRMINGHAM, PITTSBURGH, NEW YORK, SAN FRANCISCO, WASHINGTON

Excavator - Crane - Bulldozer Combination Speeds Railroad Construction and Maintenance

tractor-mounted

HYSTAWAY®

works on or off tracks

Many railroads are combatting the high cost of maintenance and construction with a unit that requires no train crew or locomotive while on the job. Completely self-contained, this outfit consists of a Hystaway mounted on a Caterpillar-diesel Tractor equipped with *ESCO* track-walking shoes and a bulldozer blade.

Able to get on or off the track easily—the Hystaway makes right-of-way maintenance work a one-machine operation. Unloading and loading rail, laying rail, handling ballast material, grading, filling and ditching are a few examples of Hystaway versatility. Rails placed in position by Hystaway do not require spiking or joint bars before Hystaway moves ahead to pick up the next rail.

Hystaway has "no tail swing" so it can work up against cars, in tunnels and other places where conventional excavator cranes can't operate.

You can mount a Hystaway on a *new* or *used* Caterpillar-diesel tractor *fast* without special equipment or tractor alterations.

Ask your Caterpillar-Hyster Dealer for details, or write to: HYSTER COMPANY, 2902-56 N. E. Clackamas Street, Portland 8, Oregon, or 1802-56 N. Adams Street, Peoria 1, Illinois.

HYSTER COMPANY

"Matched Design" Tractor Equipment for All Industries

3 Newsworthy Developments of Special Interest to Track and Structure Executives

This photograph shows picture of bridge completely protected on the upper surfaces by the LIBBEY-ZONE Process.

1

LIBBEY-ZONE PROCESS
(All Weather)
Application of fire protection of railway bridges

Primer Coat Eliminated in New All-Weather Improved LIBBEY-ZONE PROCESS

The famous LIBBEY-ZONE PROCESS for bridge deck fire protection is now a *one-coat* application. Formerly primer and asphalt-asbestos binder were separate applications, followed by the gravel aggregate. Now both binder and primer are combined, cutting time and cost of application by nearly one-half. The new material, ZONE Heavy-Duty Coating #2 (AA), is available for immediate shipment.

Photograph shows ZONE FIREPLATE being subjected to actual conditions on a simulated bridge end section.

2

ZONE
FIREPLATE
Patent Pending

MAJOR LINE OFFICIALLY OK's FIREPLATE Tests Prove Efficiency of Fire Retradant Coating

FIREPLATE* has just been given full acceptance by one of the nation's largest systems. FIREPLATE is now being applied to a major portion of this line's wooden bridge and trestle structures. FIREPLATE is the specially developed coating for vertical portions of wooden structures, protecting them against brush and grass fires at ground level.

In this photograph man on left is slipping ZONER Tie Shields into position; man on right is re-installing tie plates.

3

The New
ZONER**
Patented U.S. Patent Office

ZONER** Tie Shield Now Completely Self Sealing

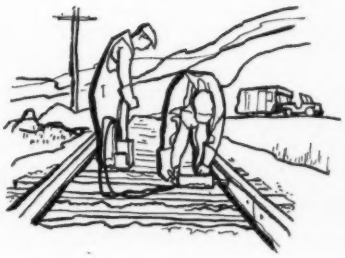
Formerly a "smear" of asphalt binder was required to seal the ZONER** Tie Shield to the tie. This extra operation has now been eliminated; the new improved ZONER Shield is completely self-contained and self-sealing. It is only necessary to position on the tie and then lay tie plate and rail in the usual manner. Another labor and cost savings from ZONE.

For information, samples or engineering data on any of the ZONE COMPANY Rail Products, please write to the Rail Products Division. We welcome your inquiry.

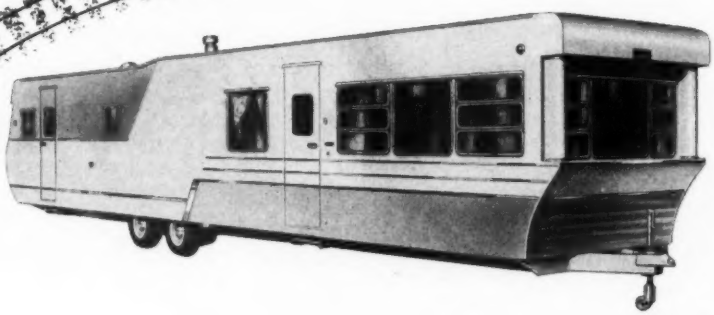
The ZONE Company

Rail Products Division
Box 789, Fort Worth 1, Texas

are your needs small...



or large...



for Off-Track Housing

Whatever your needs RICHARDSON has a model to meet your requirements!

RICHARDSON HOMES CORPORATION
Elkhart, Indiana

Please send information on your Off-Track Housing Units.

Name _____

Address _____

City _____ **Zone** ___ **State** _____

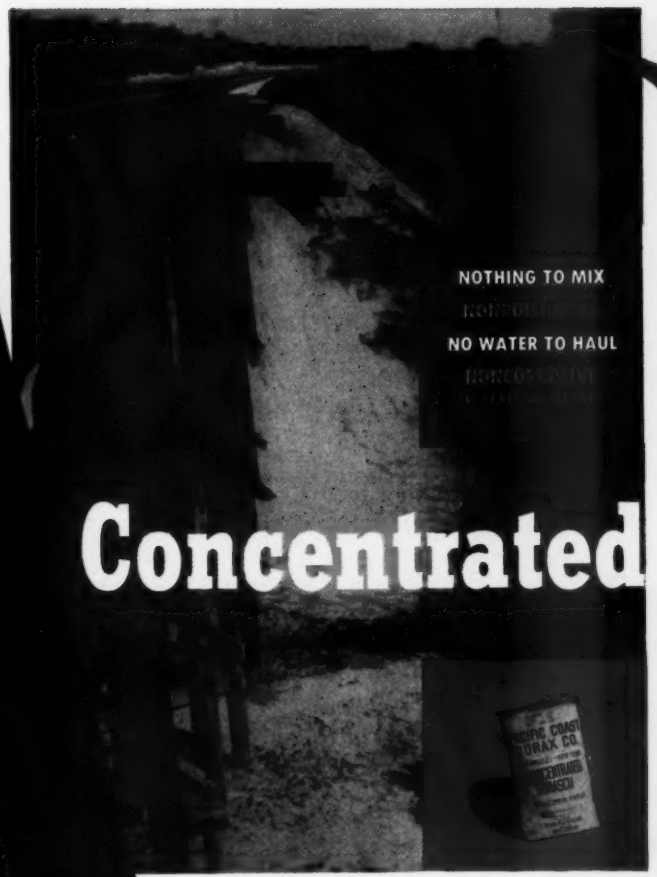
Get the complete facts on RICHARDSON mobile units for Off-Track Housing. Fill out the convenient coupon and mail it today.

ELKHART
INDIANA

Richardson
HOMES CORPORATION

Where hand scalping costs are too high!

Effectively Stop Weeds *this low-cost thrifty way!*



SAVE Up to 85% of your grassing costs!
Put Concentrated Borascu Weed Killer about your timber structures, yards, tie piles, sidings and buildings to get greatest protection from brush fires at lowest cost! Weeds-grasses are stopped, leaving nothing but bare ground wherever Concentrated Borascu is applied properly. Don't sacrifice your costly man-power on grassing...this modern method is thriftier!

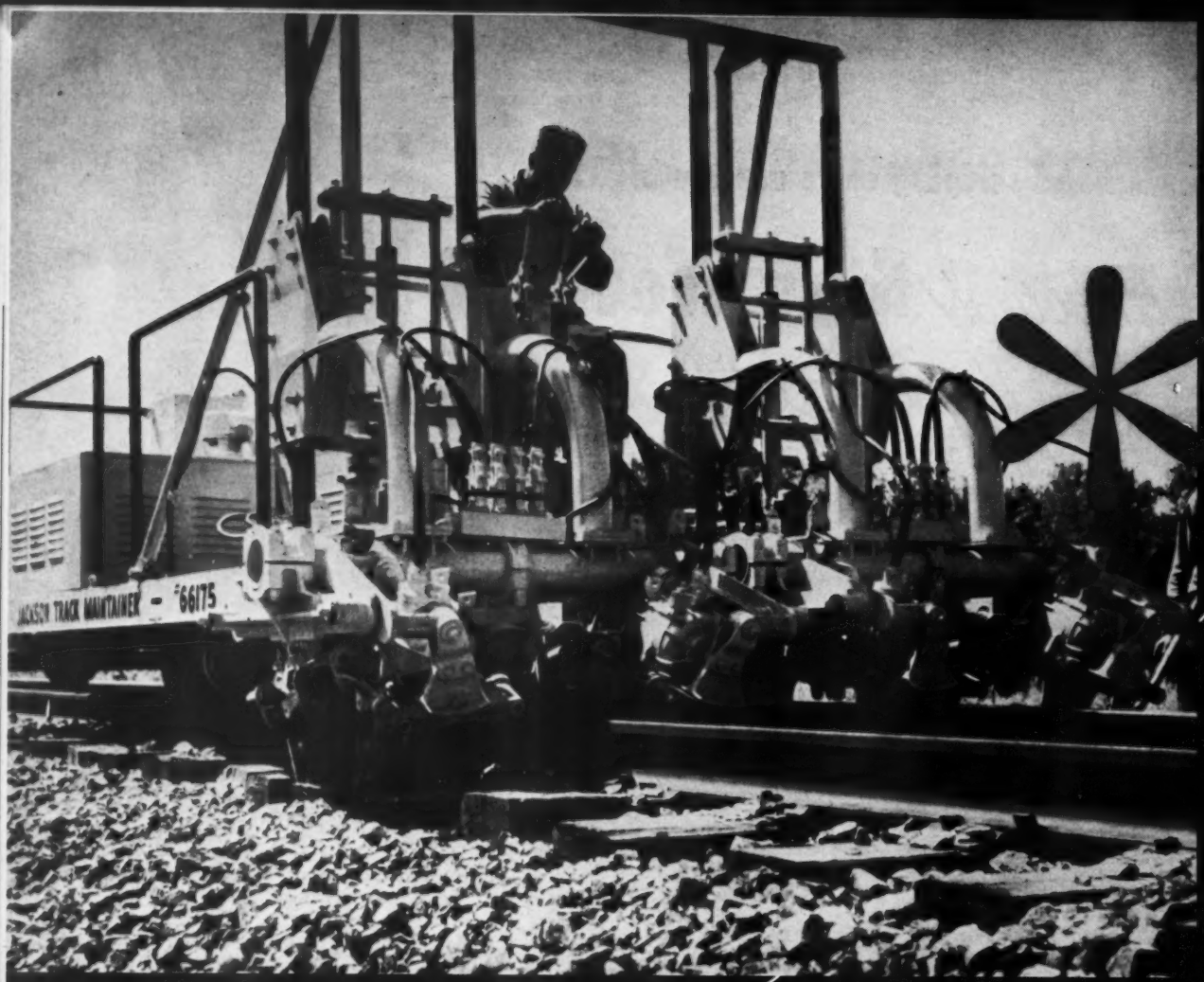
Concentrated Borascu®

When Borascu's in...weeds stay out!
Weeds and grasses just *can't* grow on soil where Borascu has been applied! And such soil remains sterile for long periods because this inorganic borate doesn't break down. Applications are simple; there is nothing to mix . . . no water to haul and the most unskilled laborer can do the job. You'll find it pays to use Concentrated Borascu.

Saves you Dollars!

Kills Weeds for Pennies!

PACIFIC COAST BORAX CO.
DIVISION OF BORAX CONSOLIDATED, LIMITED
630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA



TRACK MAINTAINER

FOR 1956

This is the machine you are virtually sure to specify if you want the best possible means of both putting up and maintaining track of finest quality — regardless of conditions or type of ballast used. For, investigation of what it has done and is doing on leading railway systems in all parts of the country is bound to convince you of the JACKSON TRACK MAINTAINER'S vast superiority. By all means write, wire or phone for the facts before making your recommendations for '56.

Acquirement plans to suit your needs.

JACKSON VIBRATORS INC.

LUDINGTON, MICHIGAN

Keep Brush Down the Economical *Proven* BOGLE Way...

Chemical control of brush has come into its own. On road after road, the savings have been substantial over other methods. One of the pioneers in the successful application of brush killer, the Bogle organization has the right kind of chemicals for treating brush, men who know how to apply them and a fleet of modern, up-to-the-minute spray cars. You are free to draw on the wealth of experience we have accumulated in the treatment of a wide variety of brush conditions.

We shall gladly work out a program with you based on your own conditions and covering brush or weed applications, or both.

The R. H. BOGLE Company

ALEXANDRIA, VA.

Memphis Tenn

COMPLETE WEED and BRUSH KILLING SERVICE

RAILWAY
TRACK and STRUCTURES

Subject:

Dear Readers:

Keeping Ahead of the Boss

If you have a boss—and who hasn't?—it is almost certain that at one time or another he has made suggestions for improvements in the practices being followed by you or your department. This happens every day and at every level in any business organization. In the railway M/W field, the trackman is on the receiving end of suggestions from his foreman, who, in turn, is constantly getting them from the track supervisor—and so on up the ladder until we find the chief engineer listening to suggestions from the president or the vice-president.

Students of human nature can tell much of significance from the manner in which these suggestions are received. Before going into this phase of the subject, let's assume that the boss (your boss) is a fair-minded individual who knows his business and yours, and who is merely trying to do a good job for his employer. After all, most persons in responsible positions come in this classification; actually the type who is incompetent or unreasonable comprises only a small fraction of the total.

Let's suppose that your boss offers a suggestion about some aspect of your work. Let's assume further that you recognize his reasoning to be entirely sound. How do you react under such conditions? Do you embrace the idea whole-heartedly and proceed to put it into effect in a spirit of cooperation? Or are you more apt to adopt a resistive or defensive attitude in which there is an element of resentment?

Human nature being what it is, many of us feel a strong temptation to resist these suggestions, but common sense tells us that such an attitude is actually harmful to our personal interests. Perhaps it might help if we were to acquire a better understanding of why we tend to react in a negative way when confronted with a situation of the type we are discussing. In other words a little self-analysis might be in order here. We might even find that the resentment we feel is partly directed toward ourselves for not having thought of the idea first. Or perhaps we thought of it but didn't put it into effect because of inertia or just plain laziness, or just because we didn't want to go to the trouble of adapting ourselves to something new. In that case we have only ourselves to blame if we find that an idea we discarded has been adopted and is being put forward by the boss.

It is possible, of course, for us to avoid many of these uncomfortable situations. That can be done simply by getting on top of our job and staying there, that is, by keeping abreast of developments in our field and by a willingness to adopt those we find to be superior to the practices now in use. We will, of course, encounter some ideas that don't seem to fit into the picture; in that case, if our thinking is genuinely objective, we will have a ready answer in case a superior should advance any of them.

It is a mighty comfortable feeling to be in a position to prod the boss instead of constantly being under pressure from him. MHD

57 YEAR OLD BRIDGE TIES

Still good because they are DRY on this COVERED Railroad Bridge

BIRD TIE PADS protect the ties even more effectively than a covered bridge

The above bridge on the St. Johnsbury and Lamoille County Railroad near Swanton, Vermont was built in 1898. The original *untreated fir* ties, *without tie plates*, are still in excellent condition. They are good for a great many more years of service as shown in the close-up insert.

Light traffic? Not at all . . . heavy shipping of limestone, talc, and pulpwood results in approximately 25 year bridge tie life on this road's standard type bridges (uncovered, treated ties, and tie plates) — a little longer than on the largest and heaviest tonnage American railroads.

These ties are still good after 57 years because they were protected from sun and rain. The reason for covering is simple. The truss framework of a wooden bridge and the bridge ties—exposed to the weather—will quickly rot and warp. Covering the trusses and putting on a roof gives the bridge a life expectancy of 50 to 75 years rather than just a decade.

Bird Tie Pads protect the under plate area of ties even more effectively than this covered bridge has. The same tight tacky seal that keeps the wood dry also eliminates both plate motion and abrasives, and consequently mechanical wear. Furthermore, the spike hole wood is kept dry and sound, keeping spikes tight and helping greatly in holding gauge and line. *Write to address below, Dept. HTS-9, for full details.*

East Walpole, BIRD & SON, inc. Established 1795 **Massachusetts**

DEPTH HARDENED Manganese Steel

Greater resistance to wear -- smoother riding -- greater strength and safety -- lower maintenance costs – PATENTED

DEPTH HARDENED MANGANESE STEEL CROSSINGS were introduced in 1936 by the RAMAPO AJAX DIVISION of the AMERICAN BRAKE SHOE COMPANY who since then have supplied hundreds of crossings of this type that have established enviable service records by their outstanding performance. The RACOR method of depth hardening has assured a greater resistance to wheel wear and smoother riding and has been a large factor in lowering crossing maintenance costs during those fifteen years.

RACOR depth hardening is a special process that provides the initial work hardening to manganese steel crossing castings in the shop prior to their installation in track. A Brinnell hardness in excess of 400 is attained that defers the flowing of the metal at the corner intersections and makes possible an increase of over thirty per cent in the service expectancy of manganese crossings.

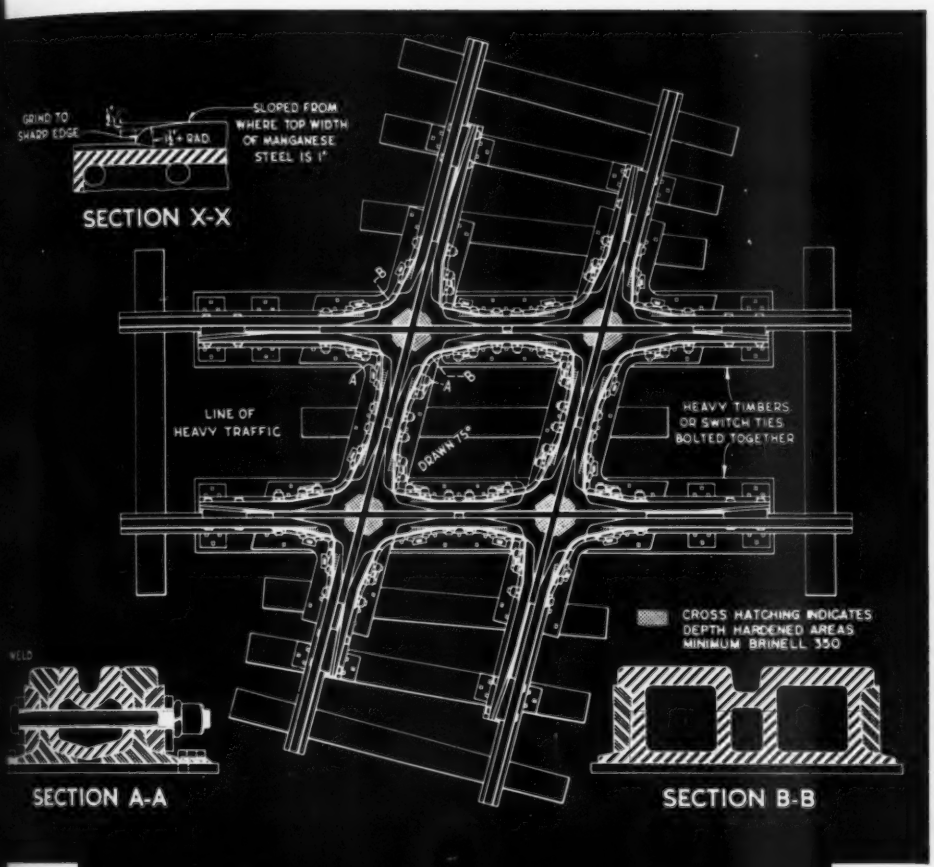
The greater structural strength of the integral base design assures longer life for crossing castings. It reduces flangeway cracking and holds the castings together even when this occurs.

We are continually striving through RACOR field engineering and BRAKE SHOE laboratory research to produce the very best in crossings and other track work specialties to meet the most exacting demands of today's traffic problems.

RACOR INTEGRAL BASE DEPTH HARDENED construction can be supplied in SOLID and INSERT A.R.E.A. manganese steel crossing designs.

WRITE FOR DESCRIPTIVE FOLDER

el Crossings SINCE 1936


GRIND TO SHARP EDGE
SLOPED FROM WHERE TOP WIDTH OF MANGANESE STEEL IS 1"
SECTION X-X
LINE OF HEAVY TRAFFIC
HEAVY TIMBERS OR SWITCH TIES BOLTED TOGETHER
DRAWN TS*
CROSS HATCHING INDICATES DEPTH HARDENED AREAS MINIMUM BRINELL 350
WELD
SECTION A-A
SECTION B-B

RACOR REVERSIBLE DESIGN

America's most complete line of track specialties

RACOR SNOW BLOWERS

RACOR STUDS

RACOR TIE PADS

AUTOMATIC SWITCH STANDS

TYPE M & MJ VERTICAL SWITCH RODS

SAMSON SWITCH POINTS

SWITCH POINT LOCKS

RAIL LUBRICATORS

ADJUSTABLE RAIL BRACES

DEPTH HARDENED CROSSINGS

REVERSIBLE MANGANESE STEEL CROSSINGS

MANGANESE STEEL GUARD RAILS

MANGANESE STEEL SWITCH POINT GUARD RAILS

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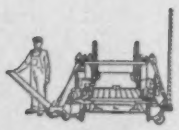
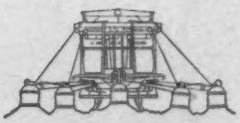
IS YOUR PROBLEM WEED CONTROL?

W24 SERIES A WEED MOWER *features cutting bars which are hydraulically operated by an engine-driven pump. Sickles are driven by hydraulic motors. A special safety snap-sickle design kicks back from obstructions and resets automatically. Swaths can be changed without stop. Can cut up to almost fifteen feet on either side of track centerline.*

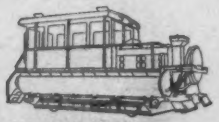


M5 SERIES A WEED MOWER *provides fast, efficient cutting at minimum cost. An automatic cutter bar release, heavy-duty sickles and clutch-equipped engines highlight its performance characteristics.*

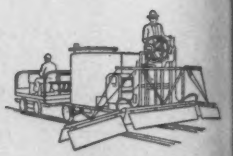
W44 SERIES D WEED BURNER *is a tow unit designed for short lines and limited burning. Two outer burning arms are counterbalanced for easy operation. Unit can be operated entirely from within cab.*



W55 SERIES B WEED BURNER *is an unusually thorough and efficient weed killer and snow melter. Burner heads can be positioned quickly and easily. Flame reaches vegetation regardless of roadbed contour.*



W66 SERIES B WEED SPRAYER *is a self-propelled unit fitted with two sets of differently sized nozzles which may be used together or separately. Minimum crew. Three-speed, two-way drive with fluid coupling.*



W78 SERIES A WEED SPRAYER *is a trailer-type unit which applies liquid weed killers. Lightweight, compact, low cost. Features include a two-cylinder engine, 800-gallon tank and eleven-nozzle spraying action.*

You'll find the answer at Fairmont

If weed control is one of your maintenance problems, we know you will want to give careful consideration to the Fairmont products pictured above. For they represent Fairmont's finest answers to virtually every weed control problem with which you might be confronted. Regardless of the method best suited to your needs . . . regardless of the amount of service you might require of your equipment . . . and regardless of the investment you are able to make . . . you will find the answer at Fairmont! And in choosing Fairmont, you will be assuring yourself of the finest in design . . . in craftsmanship . . . in dependability . . . and in economy of operation. For these qualities are *standard equipment* in every product that bears the famous Fairmont name plate. Truly, in the field of weed control, as in every other area of maintenance operation, Fairmont stands pre-eminently alone . . . and offers still further proof that Fairmont is your finest source for every maintenance need.

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RAILWAY

TRACK and STRUCTURES

September, 1955 **Vol. 51, No. 9**

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Wait! It Might Be a Good Idea

Observation of certain recent developments in the railroad field point to a curious phenomenon. What has happened in several instances is that new ideas that were tried out years ago without apparent success have suddenly been found to possess great merit and are gaining wide acceptance.

The most prominent example of such an occurrence is the "rediscovery" of "piggyback" service—the transportation of highway trailers on flat cars. When first introduced many years ago this idea was widely heralded as at least a partial antidote for the loss of business to highway trucks. But the enthusiasm for it died down as quickly as it had flared up, and "piggyback" soon became just another idea that had fizzled. The recent resurrection of trailers-on-flat-cars, and its adoption by many railroads, is a story that is familiar to every railroader.

In the M/W field we have the example of the undertrack plow. More than three years ago several articles were published on the use of plows of this type in Sweden and by a railroad in this country. There was a brief flicker of interest—and that was all. It seemed that the idea of the undertrack plow had been rejected as impractical or uneconomical. But now it has been reintroduced and in a span of a few short months has gained acceptance on a number of important roads.

Why were these apparently meritorious ideas rejected when they were first introduced? Was it that their true worth was not accurately appraised in the beginning, or could it be that the right combination of conditions necessary to acceptance did not evolve until a later date?

Doubtless many individual readers can recall other examples of ideas which, after first being cast aside, were later discovered to have great value. The objective should be to reduce such happenings to a minimum in the future.

Evaluating "Stand-Up" Time

Unproductive time in this age of mechanization may not be as costly in the overall maintenance picture as might be expected from casual observation.

A great deal of emphasis is placed on "stand-up" or unproductive time as a factor in determining the efficiency of track gangs. No one will argue that it is not important, but it is only one factor.

When we come right down to brass tacks, we are not primarily interested in efficiency ratios or percentages, but in cold, hard cash. The real measuring stick of efficiency is unit cost. If we say that a certain tie-renewal and surfacing gang is X per cent efficient, that doesn't really tell us much. But if we say, based on unit costs, that this gang is X per cent more or less efficient than other similar gangs, then we have developed some real "meat" for further study.

The efficiency of this organization might be quite low if it is measured by the ratio of actual working time to total time. On the other hand, its efficiency based on unit cost figures could be relatively high.

Maintenance men have often been heard to marvel at the high production of a mechanized track gang, but then in the next breath remark that "we couldn't use an organization like this on our road; we'd lose too much time clearing trains."

A closer inspection might reveal that, even though this gang could work only four hours per day on a heavy-traffic territory, the cost of the work might still be lower than that done by hand.

It is not at all uncommon in these days to find a mechanized gang doing five times the work that a comparable gang could do with hand tools. With this kind of production, one can afford to pay quite a sum for equipment depreciation and unproductive time and still come out ahead.

TEAR HERE AND POCKET FOR READY REFERENCE

PROGRAMS

Concurrent Annual Conventions
Roadmasters' and Maintenance of Way Association

and the

American Railway Bridge & Building Association

Conrad Hilton Hotel, Chicago, September 19-21, 1955

(All Sessions Chicago Daylight Saving Time)

JOINT SESSION

(Williford Ballroom)

Monday, September 19

10:00 a.m.—Meeting called to order.
Invocation by Dr. Timothy J. Reeves.
Welcome by presidents of the Roadmasters' and B&B Associations.
Greetings from American Railway Engineering Association.
Greetings from Track Supply Association.
Greetings from B&B Supply Association
10:30 a.m.—Address by J. P. Kiley, president, Milwaukee Road, on New Challenges to Maintenance Officers.
11:15 a.m.—Address by R. N. Begien, Jr., staff assistant to vice-president operations, Chesapeake & Ohio, on Trends in Railroad Operation.
12:00 noon—Joint Announcements.
12:05 p.m.—Adjournment.

MONDAY AFTERNOON

ROADMASTERS' SESSIONS

(Williford Ballroom)

2:00 p.m.—Address by President R. G. Simmons.
2:15 p.m.—Recognition of past presidents by Mr. Simmons
2:25 p.m.—Report of Necrology Committee by G. B. McClellen, chairman.
2:35 p.m.—Report of Committee on Improved Methods in Operation and Maintenance of Work Equipment—R. H. Beeder, chairman (assistant chief engineer system, Santa Fe, Chicago)
3:25 p.m.—Report of Standing Committee No. 1 (Machinery for Maintenance of Way Work)—A. H. Whisler, chairman (assistant engineer, Pennsylvania, Philadelphia, Pa.)
3:30 p.m.—Report of Committee on Modern Methods for Handling Snow—R. W. Middleton, chairman (division engineer, Milwaukee Road, Butte, Mont.)
3:55 p.m.—Color film showing operation of Milwaukee Road's new electric rotary snow plow.
4:15 p.m.—Adjournment.

BRIDGE & BUILDING SESSIONS

(South Ballroom)

2:00 p.m.—Address by President H. M. Harlow.
2:15 p.m.—Recognition of past presidents.
2:30 p.m.—Report of Committee on Use of Special Bolts in Structural Work—H. M. Dick, chairman (supervisor structures, Pennsylvania, Harrisburg, Pa.)
3:00 p.m.—Report of Committee on New and Improved Tools for B & B Work—R. L. Fox, chairman (division engineer, Southern, Alexandria, Va.)
3:30 p.m.—Report of Committee on Welding—Applications to B & B Work—E. M. Cummings, chairman (division engineer, Baltimore & Ohio, Garrett, Ind.)
4:15 p.m.—Adjournment.

TUESDAY MORNING

September 20

9:30 a.m.—Report of Committee on Training Programs for Maintenance of Way Personnel—R. B. Radkey, chairman (engineer ties and treatment, Illinois Central, Chicago.)
10:10 a.m.—Report of Committee on Effect of Dieselization on Track—W. C. McCormick, chairman (general roadmaster, Seaboard Air Line, Jacksonville, Fla.)
10:50 a.m.—Report of Standing Committee No. 2 (Track)—D. C. Hastings, chairman (superintendent, Richmond, Fredericksburg & Potomac, Richmond, Va.)
10:55 a.m.—Report of Committee on Handling, Laying and Maintaining Continuous Welded Rail—L. B. Cann, Jr., chairman (division engineer, Richmond, Fredericksburg and Potomac Railroad, Fredericksburg, Va.)
11:20 a.m.—Colored slide views of handling and unloading continuous welded rail, with running comments by Mr. Cann.
11:50 a.m.—Adjournment for lunch.

9:30 a.m.—Report of Committee on Heating and Ventilating Diesel Shops—D. E. Perrine, chairman (assistant chief engineer, Chicago & Western Indiana-Belt Railway, Chicago.)
10:20 a.m.—Report of Committee on Construction and Maintenance of Roadway Signs—F. W. Hutcheson, chairman (supervisor bridges & buildings, Chesapeake & Ohio, Newport News, Va.)
11:10 a.m.—Report of Committee on Sanding Facilities for Diesel Locomotives—R. H. Patterson, chairman (supervisor bridges & buildings, St. Louis Southwestern, Pine Bluff, Ark.)
12:00 noon—Adjournment for lunch.

TUESDAY AFTERNOON

(Williford Ballroom)

2:00 p.m.—Address by H. C. Munson, vice-president and general manager, Western Pacific, on Operation Maintenance of Way—Where Does It Fit In?
2:50 p.m.—Panel discussion
Subject—"What Kind of Houses for Maintenance Men?"
Moderator—E. L. Anderson, chief engineer, Frisco.
Speakers—H. B. Christianson, Jr., assistant chief engineer, Rock Island (Trailer Housing.)
G. R. Collier, district engineer, Gulf, Colorado & Santa Fe (Camp Cars.)
R. V. Dangremond, roadmaster, Elgin, Joliet & Eastern (Permanent Camps.)
3:50 p.m.—Color motion picture with sound commentary—"Challenge for Tomorrow" (Unusual safety film produced by Santa Fe.)
4:15 p.m.—Adjournment.

TUESDAY EVENING

(Grand Ballroom—Informal)

6:30 p.m.—Joint annual banquet of the Roadmasters' and Bridge & Building Associations—with Supply Associations.

WEDNESDAY MORNING

September 21

9:30 a.m.—Report of Standing Committee No. 3 (Roadway)—R. H. Carpenter, chairman (district engineer, Missouri Pacific, St. Louis).
9:35 a.m.—Report of Committee on Importance of Curve Lubricators, Their Installation and maintenance—M. G. Counter, chairman (district maintenance engineer, Chicago, Burlington & Quincy, Burlington, Iowa).
10:10 a.m.—Business session.
Election of officers and installation by H. E. Kirby.
11:00 a.m.—Adjournment.

9:30 a.m.—Report of Committee on Trends in B & B and Water Service Organization—V. D. Raessler, chairman (supervisor bridges & buildings, Illinois Central, Memphis, Tenn.)
10:15 a.m.—Color moving picture "Moving Day" showing how vertical-lift span was floated into position on Northern Pacific at Pasco, Wash.
11:00 a.m.—Business session.
Election and installation of officers.
11:45 a.m.—Adjournment.

WEDNESDAY AFTERNOON

12:00 noon—Board CSS&SB train of Illinois Central Van Buren Street Suburban Station for trip to the Gary Rolling Mill, United States Steel Company.
12:50 p.m.—Inspect rolling, heat treating and end hardening of rail at mill.
3:48 p.m.—Board CSS&SB special train to return to Chicago.
4:38 p.m.—Arrive Illinois Central Van Buren Street Suburban Station.

VISIT TO POWERAMA

No formal events have been scheduled for Wednesday afternoon in order that members and their wives may have an opportunity to visit General Motors' Powerama with its stage shows and 150 operating exhibits. Located on South Lake Shore Drive at Soldier Field the Powerama is only a few minutes ride by bus or car from the convention hotel.

Wm. A. Maxwell

H. R. Deubel

Greetings from the Supply Associations . . .

TO MEMBERS OF THE ROADMASTERS' ASSOCIATION AND THE AMERICAN RAILWAY BRIDGE & BUILDING ASSOCIATION:

Greatly improved earnings for the majority of our railroads over those of a year ago have made the situation very much better for your members, permitting larger allowances of labor and materials. This provides the means of securing better track and the opportunity of strengthening and modernizing of structures.

However, the increasing cost of both labor and materials makes it more than ever important to secure maximum results by careful planning and the use of new ideas and better methods of doing work. At your September conventions these will be covered by papers and discussions of the down-to-earth problems which your members meet every day in their work. The program will also include several interesting and informative addresses by railroad officers of experience, who will bring messages of value to all.

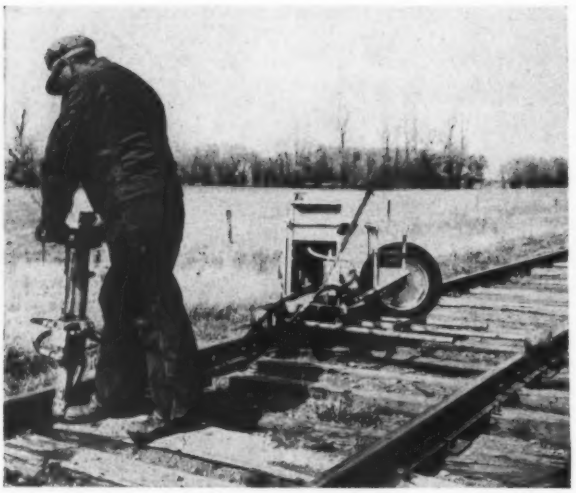
Recognizing the need for some diversion from the close attention to the reports of your scheduled meetings, our associations will tender a banquet on Tuesday evening, September 20, at the Conrad Hilton Hotel, to which your members and their ladies are cordially invited to be our guests. The program will contain some novel features which the arrangements committee is convinced will help make the evening an enjoyable one for all.

In keeping with our policy during years in which exhibitions are not held, our members will refrain from having displays of any kind in their hotel suites; however, it is a privilege for the men of our supply firms to be able to attend your meetings to learn how they may be of service in helping you solve problems of the proper application of materials and the use of labor-saving equipment. In the meantime we are sure you will be interested to know that preliminary arrangements have already been made for our next exhibition which will be held at the Coliseum, Chicago, during your convention in 1956.

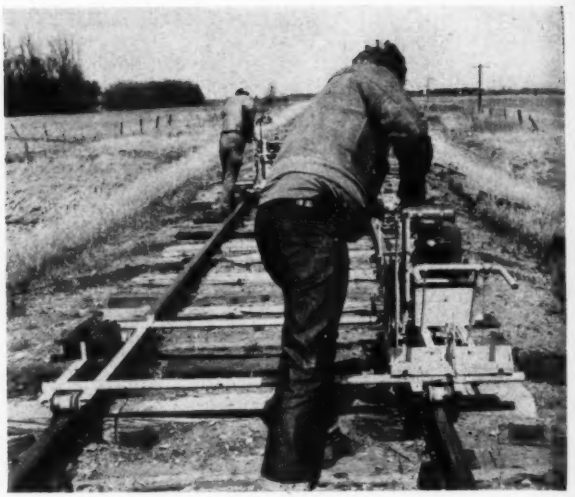
The exchange of ideas and information at your conventions is sure to stimulate efforts to operate your departments with increased economy and efficiency. We are happy to extend greetings and to express our best wishes for the success of these meetings.

Wm. A. Maxwell
President
The Track Supply Association

H. R. Deubel
President
Bridge and Building Supply Association



1 SPIKES are removed from ties to come out by one man using a Nordberg hydraulic spike puller.



2 TIE SAWS cut ties into three pieces with each machine making cut about 3 in inside the rail.

Low-Cost Tie Renewals . . .

. . . *Without Disturbing the Track Surface*

Soo Line is using 16-man gangs with a variety of mechanized equipment, including tie saws, tie-butt removers and a Gandy, for making its maintenance tie renewals. Crews are replacing upwards of 350 ties per gang per day.

● "We're currently renewing ties at an average rate of 3 per man-hour without disturbing the track surface and with a minimum of costly equipment."

This statement was made by T. R. Klingel, engineer maintenance of way of the Soo Line, in discussing that road's new 16-man tie-renewal gangs. These gangs, two of which are currently in operation, are completely mechanized with an assortment of machines permitting removal and insertion of ties without raising or humping the track. Total cost of all equipment for each gang is about $9,000.

The first of these mechanized gangs began work in April on the road's Brooten (Minn.)—Duluth branch. Since this was the first operation of its kind on that road, a great deal of experimenting was necessary in order to arrive at the most effective gang organization. At first, production was about two ties per man-hour, but steadily increased as the organization was worked out and the men became better acquainted with the equipment. Tie renewals on that line were running about 270 per mile and at the time the gang was inspected it was replacing an average of 55 ties an hour.

How Work Is Done

In renewing ties, the work is divided into two principal parts; however, the entire gang operates more or less as a single unit. The "head-end" portion of the gang removes the old ties and inserts the new ones. The "rear-end" crew is employed in tamping up the new ties and in driving spikes.

One man, using a Nordberg spike puller, leads off the operations. This man also knocks off rail anchors and helps dig out ballast ahead of the tie saws. Another man is engaged full time in digging out ahead of the saws. This work consists of removing ballast from both sides of the tie for a distance of about 4 in inside each rail. The men use 4-in spades for this work, and about one shovelful is all that it is necessary to remove.

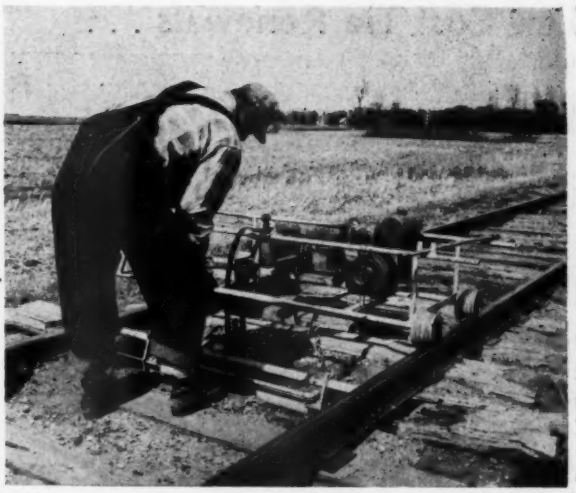
Two Woolery tie saws are used to cut the old ties into three pieces. One of these saws makes a cut through the tie about 3 in inside one rail, while the other makes a similar cut inside the other rail. Each of the saws is operated by one man. Following the saws is one man with a Woolery tie-butt remover and a single-pointed tie pick. He uses the pick to remove the center portion of the cut tie and then uses the tie-butt remover to push the end pieces out from under the rails. This same man removes the tie plates, and uses his pick again to drag the tie ends out away from the track.

New ties are inserted by three men with a Nordberg Gandy. One man digs out the ballast shoulder slightly on one side so that the new tie can be started under the rail. This man also pulls the new tie into position so it can be forced under the rails by the Gandy. One man serves as operator on the machine, and the third man places the cable hook over the end of the tie and steers the tie as it is forced through the crib.

Use Air Tools Behind

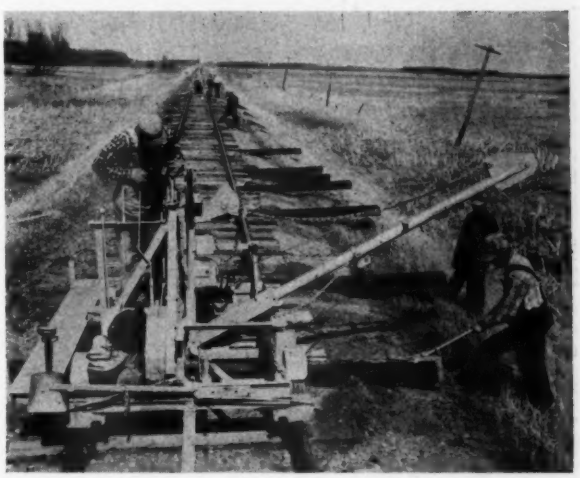
Behind the Gandy the "rear-end" crew is equipped with an Ingersoll-Rand Spot-Air 36-cfm compressor mounted on a push car. The compressor furnishes air for operating two I-R tamping guns and one I-R pneumatic spike hammer. The tie-tamping work employs four men. One man uses a Fairmont tie nipper to hold the ties in place while two others use the pneumatic guns for tamping. The fourth man shovels in ballast and dresses off.

3 CENTER PORTION of cut tie is removed by operator of tie-butt remover, using a single-pointed pick.



4 TIE ENDS are pushed out from under the rails by a Woolery hydraulically-operated tie-butt remover.

5 OPERATOR of machine again uses his single-pointed tie pick to drag tie ends out of the way.



6 NEW TIES are inserted by three men using a Nordberg Gandy. Machine can also be used to pull gang trailer.

Turn page for more pictures →

Tie plates are installed after the ties have been tamped. It was found that the work moved along faster when plates were installed behind rather than ahead of the tampers, in that it is not necessary to tamp so hard when the plates are installed behind. With a comparatively light tamping and the plates installed behind, the track comes back into good surface after settlement.

Tie plates are applied by two men, one of whom nips the rail with a One-Man Track Tool while the other places the plate under the rail. Behind the plate setters one man sets spikes with a small hammer ahead of another man who drives with the pneumatic hammer. Rail anchors are also reapplied by the spike-hammer operator.

One of the principal reasons for using this particular type of tie-renewal organization is to eliminate the necessity for surfacing track in conjunction with the renewal work. Soo Line officers point out that the traffic density on their road does not warrant out-of-face track reballasting more often than once every 10 years in most locations. In the interim the track is only spot surfaced as necessary.

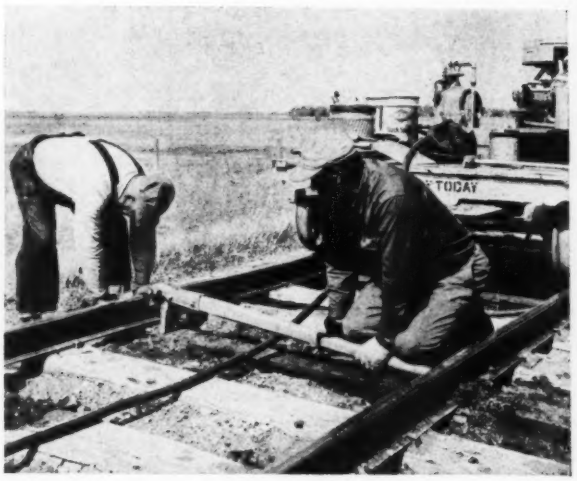
Prior to establishing the new mechanized gangs, the road used section forces for making all tie renewals. The section crews dug in ties from year to year as required. However, in recent years this had become an increasingly costly method of operation, since production of the section gangs was averaging only one tie per man-hour.

Another important factor which influenced maintenance officers to seek a more economical means of making renewals was the situation on its branch lines. Most of these lines were suffering from a bad timber condition, arising mainly from the fact that untreated softwood ties had been used on all branches up until four years ago. Dieselization of motive power in recent years more or less aggravated the bad tie condition and brought the situation to a "head." Consequently, the road had to begin a rehabilitation program on these lines to bring them into shape.

After the rehabilitation has been completed on the branch lines, the road expects to begin a three-year cycle of tie renewals, a program being inaugurated this year on main lines. With the three-year cycle program all ties will be renewed out of face which will not last until the next renewals are made at that location

Low Cost Tie Renewals . . .

7 TAMPING is done with I-R pneumatic guns while tie is held in place by Fairmont tie nipper.



8 PLATES are applied, after ties are tamped, by two men using a One Man Track Tool.

9 SPIKES are set in the new ties by one man using a small hammer ahead of a . . .

10 . . . PNEUMATIC spike hammer which is operated off the same Spot-Air compressor as the tamping guns.

three years later. The Soo eventually anticipates using six or seven of these gangs after the current rehabilitation work is completed, and the entire railroad is put on a three-year cycle basis.

The gang working on the Brooten-Duluth line is housed in bunk cars which are moved along from station to station as the work progresses. The gang is transported to and from work on a motor car; however, the Gandy can also be used to pull a gang trailer-car along the rails, but it is considerably slower if any great distance has to be traveled.

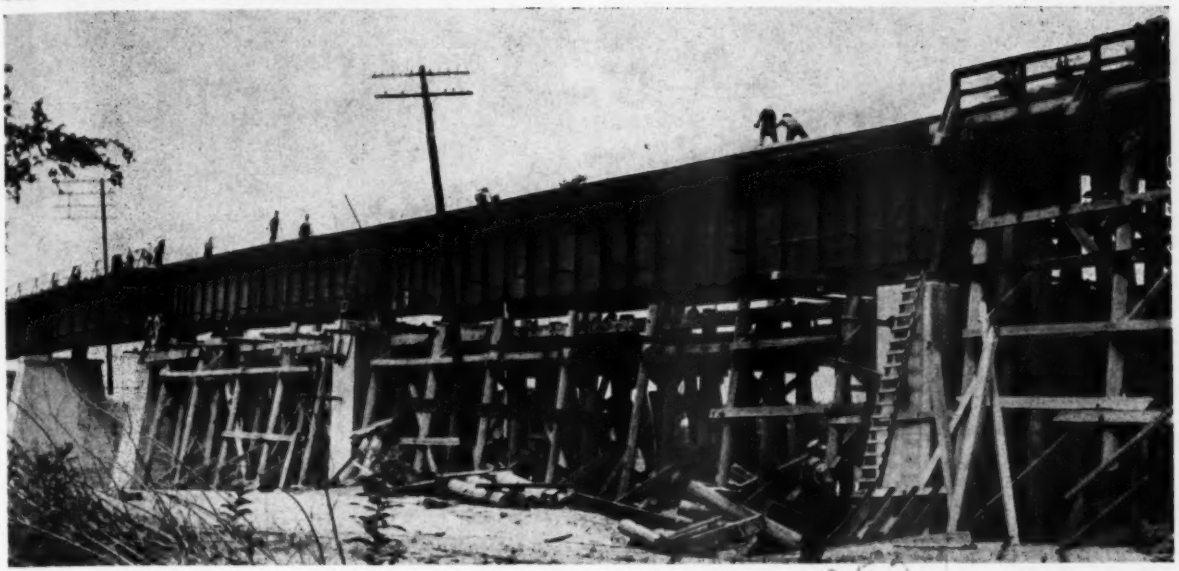
As more and more of the gangs are placed in service, the road is studying the possibility of using local labor, transporting the men to and from work in buses. The men would then live at home and would carry their lunches. Among some of the advantages claimed for this set-up are: (1) A more stable labor organization; (2) more actual on-the-job working time, particularly on main lines where there is train interference to motor-car movements; and (3) the elimination of bunk cars and commissary service.

Officers think that the first of these advantages is made increasingly important by the fact that the gangs are highly mechanized, making it desireable to have experienced men for operating the equipment. A stable and dependable labor force naturally is an important aid in making the most effective use of the machines, and even has a bearing on the life of the machines since they get better care, according to Soo Line officers.

The second tie-renewal gang, using the same equipment, and essentially the same organization, went into service on the main line of the road's Chicago division. This gang began renewing ties on the new three-year cycle program. Renewals in this territory averaged about 80 per mile. One of the distinct advantages of this type of gang organization is brought out by the work on the main line where traffic density is heavy. All of the equipment is light enough that it can be removed easily and quickly from the track. The Gandy is the only unit which requires a set-off, and it can be moved into the clear at a set-off in just a little over one minute. Thus, little actual working time is lost in clearing for trains over and above that which would be lost with hand labor.

The tie-renewal work on the Soo Line is being carried out under the general direction of E. D. Jones, general superintendent. The gangs were organized by and are under the general supervision of Mr. Klingel.

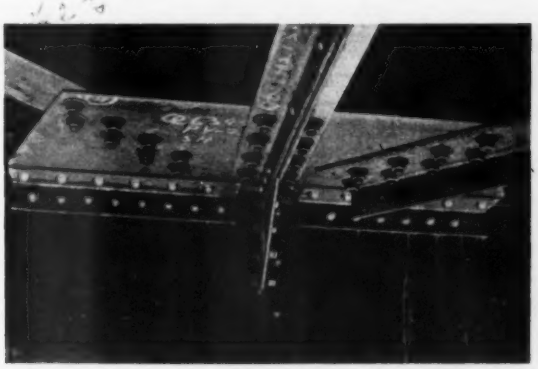
In Steel Fabrication . . .



FIELD CONNECTIONS in spans added to this bridge on Santa Fe in Oklahoma were made with high-strength bolts.

High-Tensile Bolts Are Gaining

By W. R. Wilson
Assistant Engineer,
Sante Fe, Chicago



BOLTED top lateral connection in one of the spans in the bridge shown above. Note rivets in ship-fabricated girder.

• Ever since the first wrought iron bridge was built early in the Nineteenth Century the component parts of iron and steel structures have in most cases been fastened together with rivets. The first reported tests of riveted joints were made in 1838. Rivets are made of soft carbon steel with a tensile strength of from 52,000 to 62,000 psi and they are usually hot driven.

Constant research has been going on for many years in an effort to improve structural connections. It was found that the rivets do not completely fill the holes in the connected metal and that the load is largely transferred from one member to the other by friction due to the clamping action of the rivets. It was also found that the clamping action increased as the grip of the rivet increased. These tests indicated that a superior connection would result from a fastener which would exert high clamping forces on the parts connected.

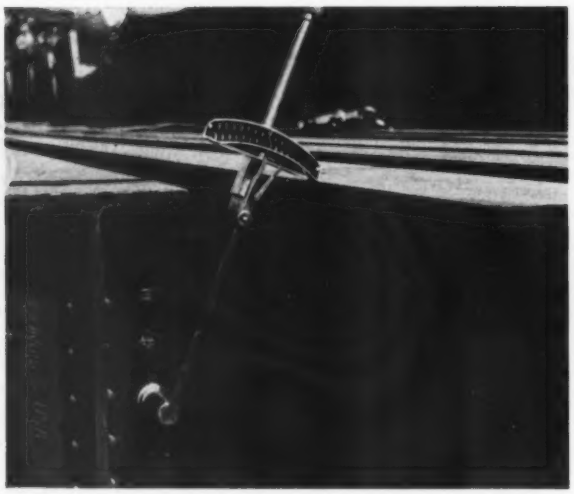
Tests show that connections made with high-strength bolts are superior to those made with rivets. Because of this and other considerations, the Sante Fe is using high-strength bolts for making field connections in steel bridges and other structures.

High-Tensile Bolts Tested

Advancements in metallurgy have made possible the manufacture of high-strength heat-treated bolts with a minimum tensile strength of 120,000 psi. Tests were made of joints using these bolts in conjunction with joints composed of hot and cold-driven rivets. These tests showed that the bolted joints were from 9 to 11 per cent stronger than the hot-driven rivets and 14-19 per cent stronger than those with cold-driven rivets. In all of the tests the failure occurred in the plates. No loosening of the nuts was noted although one specimen was subjected to 3,600,000 cycles of stress. Also, the slippage of the bolted joints was less than the riveted joints.

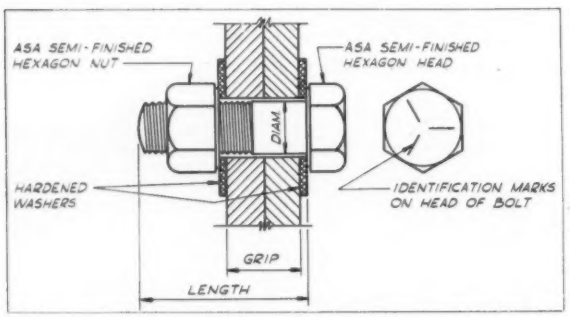
In 1948 the research staff of the Association of American Railroads, at the request of the Committee on Iron and Steel Structures of the AREA, made field-test installations of high-strength bolts in 16 railroad structures. These installations were made in railway bridges of various types, an ore-unloading dock structure and an ore unloader.

The bolts were inserted at locations where trouble had been



TORQUE wrench of type used on Santa Fe for testing tightened high-strength bolts. Capacity is 300 ft-lb.

IMPACT WRENCHES are used for tightening bolts one turn after they have been brought to finger-tight position.



DETAILS of high-strength bolt as installed. Sizes generally used are 5/8-in, 3/4-in and 7/8-in.

Minimum Tension, Equivalent Torque and Test Data for Bolts of Various Sizes

Bolt Size (In)	Minimum Required Bolt Tension (Lb)	Equivalent Torque (Ft-Lb)	Dial Setting	Extension Required (In)
5/8	17,300	180	180	0
3/4	25,600	320	240	10
7/8	32,400	470	261	24

encountered in keeping rivets tight. Over a six-year perid the high-strength bolts have, for the most part, retained their clamping power even in places where, due to vibration and repeated loading, rivets loosened and had to be renewed every year.

At the same time these investigations were being carried on, the American Society for Testing Materials was preparing specifications. In 1951 that society issued its Tentative Specifications for Quenched and Tempered Steel Bolts and Studs with Suitable Nuts and Plain Washers, which now bears ASTM designation A-325-53T. In 1953 the AREA adopted Specifications for Assembly of Structural Joints using High Tensile Steel Bolts in Steel Railway Bridges. This specification was based on the research and tests mentioned above.

Having closely followed the development of high-strength bolts, T. A. Blair, chief engineer system of the Santa Fe, and R. A. Van Ness, bridge engineer system, decided in May 1954 to adopt the practice of using such bolts in the assembly of bridges and other structures at locations where they are considered applicable. Their primary use is in making field connections; rivets are still used in shop-fabrication work.

Santa Fe Practice

In designing bolted connections on the Santa Fe the practice is to use the unit stresses specified for rivets by the applicable design specification, i.e., the AREA Specifications for Railway Bridges, the Specifications for Buildings of the American Institute of Steel Construction, and the Specifications for Highway Bridges of the American Association of State Highway Officials. The following notes are placed upon the plan:

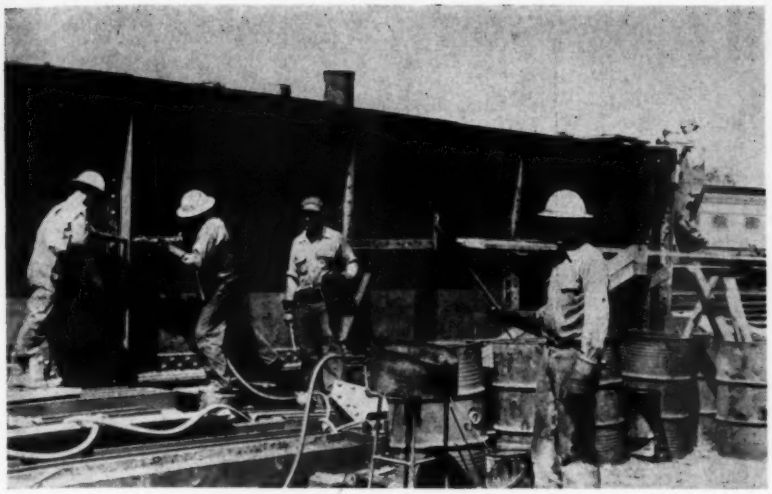
"High-strength bolts, nuts and washers shall be in accordance with current AREA Specifications for Assembly of Structural Joints using High Strength Steel Bolts and also ASTM Specification A-325.

"All field connections to have high-strength bolts, with hardened washer under head and nut. After a joint is fitted up, the nuts of the bolts not used in fitting up shall be given one turn from finger-tight position. If high-strength bolts are used in fitting up, these bolts shall be marked with keel; the nuts shall be loosened and re-tightened as above."

The marking of the fitting-up bolts with keel is done to enable the tightening crew to give all of the new bolts their proper torque and then to identify the fitting-up bolts so that they can be loosened and retightened properly. An excess of five per cent of the actual number of bolts, nuts and washers is ordered to allow for losses during erection.

The length of high-strength bolts is determined by adding 1⅛ in to the grip for ⅝-in bolts, 1¼ in for ¾-in bolts and 1½ in for ⅞-in bolts. These are the sizes of bolts generally used.

To permit the testing of tightened bolts, the steel-erection forces are provided with Sturtevant 300-ft-lb torque wrenches with 10-in



TYPICAL riveting gang has four men—bucker-up, riveter, catcher and heater. Only two men at most are needed to apply bolts.

and 24-in extensions. The minimum values and settings for testing a tightened bolt with this wrench are given in the table on the opposite page.

How They Are Applied

The bolts are tightened with impact wrenches. A mark placed on the chuck of the wrench will enable the operator to tell when the nut has made a complete turn.

An air-pressure reducing and regulating valve is placed in the air line and the air pressure so regulated that the required single turn of the nut from finger-tight position will be made in about 10 sec. A needle air gauge is inserted through the air hose near the wrench to show the air pressure at the wrench. With a little experience the field forces are able quickly to adjust the regulating valve to give the proper air pressure to get the desired results.

At locations where there is not enough room to use the impact wrench, a spud or socket wrench can be used with an extension on the handle. The length of the extension can be readily determined by the pull required to get one full turn of the nut. For a ⅞-in bolt an extension 5 to 6 ft in length is needed for one man. Hand tightening can also be used where there are not enough bolts to place to justify setting up an air compressor.

From 10 per cent to 20 per cent of the tightened bolts are checked with the torque wrench. The number to be tested depends on the results found. With an inexperienced crew, 20 per cent or more should be tested at first, and if it is found that all of the bolts are satisfactory, the number to be tested can be reduced to about 10 per cent. If several bolts in a joint are found to be loose, they should be loosened, set to the finger-tight position and given one turn. Then all of the bolts in that joint should be tested.

Their Advantages

A ⅞-in by 3-in high-strength bolt connecting members having a total thickness of 1½ in costs about 25 cents complete with nut and hardened washers, while a ⅞-in by 3⅛-in rivet connecting 1½ in of steel costs about 8 cents.

However, in spite of the higher first cost of the high-strength bolts their use is more economical. Here are some of the reasons for their relative economy:

(1) The same bolts that are used in the finished joints can be used for fitting-up the job. It is not necessary to remove the fitting-up bolts as is the case with rivets.

(2) A riveting crew requires at least 4 men while 2 men can rapidly tighten a bolted joint.

(3) Riveting requires a forge, an air rivet gun, a pneumatic bucker-up and an impact wrench for removing the fitting-up bolts. All that is needed for high-strength bolts is an impact wrench and a spud or socket wrench for holding the bolt. For small jobs the bolts can be tightened by hand, thus eliminating the need for an air compressor.

(4) Moving the riveting forge is a time-consuming job and on a majority of the jobs special scaffolds have to be provided on which to place the forge. The only tools to be moved on a bolted job are the impact wrench and the spud wrench. In many places the man holding the head of the bolt will not require a scaffold while a rivet bucker-up will usually need one.

(5) A rivet that is not tight has to be cut out, a time-consuming job, and then redriven. This often necessitates the moving of the forge for just a few rivets. A bolt that is not tight can very quickly be loosened and retightened with the impact wrench.

Another advantage of the bolted job over the riveted one is that experienced men are required in a riveting crew. Heating rivets is a job that requires a lot of skill, and it is getting increasingly difficult to find good rivet heaters. Inexperienced men can be taught to tighten a bolt in a very few minutes and, with the air pressure properly adjusted, they will continue to produce good joints. Also, the testing of a bolted joint with a torque wrench can be learned by the inspector very quickly and there is no chance of dispute if the bolt does not show at least the minimum torque, since the bolting crew can see the amount of torque on the dial. Thus many disputes can be avoided.

Example of Use

Recently a 75-ft deck-plate girder span was erected on falsework alongside a pile trestle which it was to replace. The crossframes, top and bottom laterals and end-jacking beams were all fully bolted up with high-strength bolts, with the bolts tightened with spud wrenches. The trestle was removed and the girder span slid into place and traffic allowed to run over it.

An inexperienced four-man crew, after about a half-hour's instruction while the air pressure was being adjusted, was able to bolt up the entire span in accordance with Santa Fe procedure in seven hours. In this time 788 bolts were loosened and retightened with the impact wrench. Four men were used because about one-third of the bolts to be tightened were overhead and by relieving the man at the impact wrench at frequent intervals the work was done more efficiently. It was estimated that it would have taken four men about four days to rivet this span.

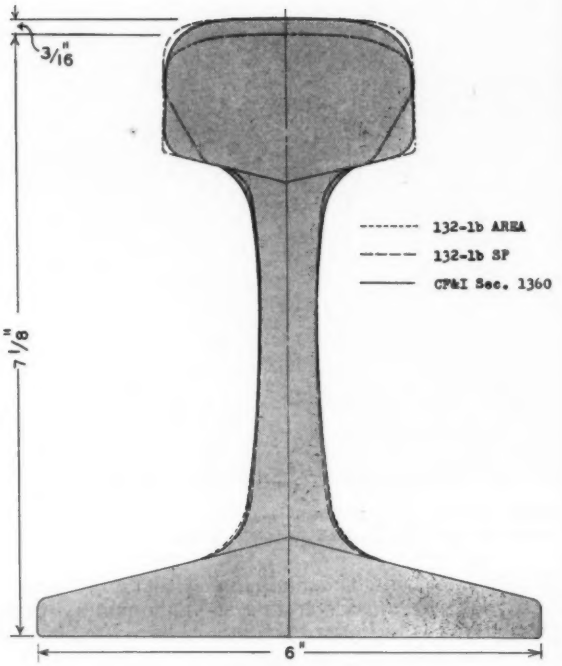
The Santa Fe to date has used high-strength bolts on 120-ft floodlight towers, shop buildings, freighthouses, I-beam spans and plate-girder spans, with good results.

It is felt that, with the continued use of this method, more experience will be gained and, as the technique of installation improves, there will be increased economies as well as the assurance of a safe structure.

Two New Rail Sections Are Designed for...

- Greater Stiffness
- More Capacity for Head Wear
- Reduced Shelling

FIRST INSTALLATION of 136-lb CF&I section was made on Western Pacific in the Smoke Creek Desert area of Nevada.



PROPERTIES OF SECTIONS

ITEM	SECTIONS		
	132 R E	132 S F	SEC. 1360
AREA: HEAD	4.42"	4.65"	4.86"
WEB	3.66"	3.46"	3.62"
BASE	4.87"	4.87"	4.87"
TOTAL	12.95"	12.98"	13.35"
Weight per yard	132.1	132.4	136.2
G.T./mile -- single track*	207.4	207.4	213.7
N.T./mile -- single track*	232.3	232.3	239.4
Moment of Inertia (I)	88.2	93.8	94.9
Section Modulus, Head	22.5	23.4	23.9
Section Modulus, Base	27.5	28.4	28.3
Ratio, "I" to Area	6.8	7.2	7.1
Ratio, Sec.Mod., Head-Area	1.7	1.8	1.8
Distance, Base to N.A.	3.2"	3.3"	3.347"

*Weight per mile based on nominal weight per yard.

PROPERTIES of the new sections, and how they compare with those of existing sections, are shown by these drawings.

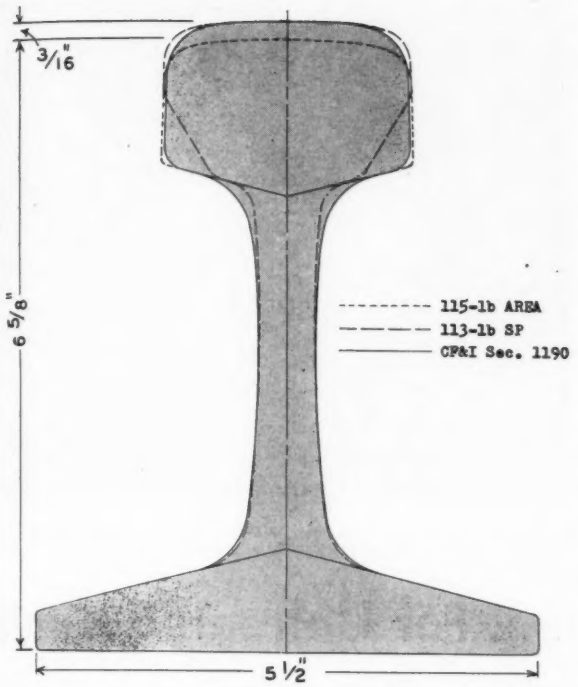
● There isn't any feature of the track structure that is escaping scrutiny in the constant effort to seek improvement. And that includes the rail itself.

During the past year, two new rail sections have made their appearance, which are specially designed with present-day needs and conditions in mind. One of these weighs 119 lb per yd and the other 136 lb per yd. Designed by W. S. Boyce, general manager railroad sales of Colorado Fuel & Iron Corp., they are known as CF&I Sections 1190 and 1360, respectively.

Are Based on SP Sections

To a considerable extent the new sections are designed around two Southern Pacific sections—the SP 113-lb and the SP 132-lb headfree sections. CF&I 119-lb rail has exactly the same height (6 13/16 in) as the SP 113-lb, and the 136-lb section has the same height (7 5/16 in) as SP 132-lb. The base widths of the comparable sections are also the same.

The main differences occur in the shape and size of the heads and the upper fillets. In the new sections the headfree shape has been eliminated and the thickness



PROPERTIES OF SECTIONS

ITEM	SECTIONS		
	115 R E	113 S P	1190
AREA: Head	3.91"	4.04"	4.32"
Web	3.05"	2.77"	3.04"
Base	4.29"	4.29"	4.29"
TOTAL	11.25"	11.10"	11.65"
Weight per yard	114.7	113.2	118.8
G.T./mile--single track*	180.7	177.6	187.0
N.T./mile--single track*	202.4	198.9	209.4
Moment of Inertia (I)	65.6	69.8	71.4
Section Modulus, Head	18.0	18.6	19.4
Section Modulus, Base	22.0	22.8	22.9
Ratio, "I" to Area	5.83	6.3	6.13
Ratio, Sec.Mod., Head-Area	1.6	1.7	1.7
Distance, Base to N. A.	2.98"	3.06"	3.124"

*Weight per mile based on nominal weight per yard.

through the upper fillets is somewhat greater. These two changes account for much of the increased weight. Important changes have also been made in the head contours, including longer radii for the upper corners of the heads.

Differ from RE Sections

There are also points of similarity to existing RE sections. The CF&I 119-lb section, for instance, is identical with the 115-lb RE section from the underside of the head down to the base. The result is that all 115-lb RE track fittings will fit the new 119-lb section. Likewise, the new 136-lb section is the same from the head down as the 132-lb RE section. This means, of course, that Rail Joint Company 100 per cent headfree joint bars for the 115-lb and 132-lb RE sections will fit the new CF&I sections.

The main difference between the new sections and the comparable RE sections is their greater height, all of which is in the head; both of the new sections are 3/16 in deeper in the head than the comparable RE sections. According to Mr. Boyce, the greater height of the new sections has a two-fold purpose—to obtain greater stiffness, which would have particular advantages where the subgrade is unstable, and to obtain longer life of the rail where head wear is the determining factor, such as on curves.

Head Contours Also Changed

The changes that have been made in the head contours of the new section also have a definite objective. The head radius of each of the new sections is 14 in compared with 10 in for the RE sections. Also the corners of the heads have longer radii—9/16 in compared with 3/8 in. Mr. Boyce states that an important reason for making these changes was to obtain a head contour that would more nearly fit the wheel treads of equipment. The result, he believes, will be to reduce rail shelling and the development of detail fractures.

Two roads—the Western Pacific and the Santa Fe—have adopted the new sections as standard, and several others have made test installations of them. Frank R. Woolford, chief engineer of the WP, explains that the 119-lb section has been adopted as standard "on our main line except in areas of unstable roadbed or heavy traffic, where we have adopted the 136-lb rail for its greater beam strength and longer life." He feels that the revised head contour of the new sections "will greatly reduce flowing of the head and shelling of the rail."

Why Santa Fe Adopted Them

On the Santa Fe the 119-lb section has been adopted as standard for the lighter traffic main lines and the 136-lb section is standard for use on main lines carrying 20 million gross tons of traffic per year or more. A primary consideration behind this road's decision to go to the new rail sections is the fact that it is planning to butt-weld all its new rail into continuous lengths. Last year a portion of its new rail was butt-welded, this year a still larger proportion was welded, and by next year the road expects that all new rail will be laid in the form of continuous strings.

In the absence of joints, explains T. A. Blair, Santa Fe System chief engineer, the life of rail will no longer be determined by end batter and droop, and wear of the fishing surfaces, but by head wear. It was decided, therefore, that rail sections having a greater depth of head were indicated, and the new CF&I sections were selected.

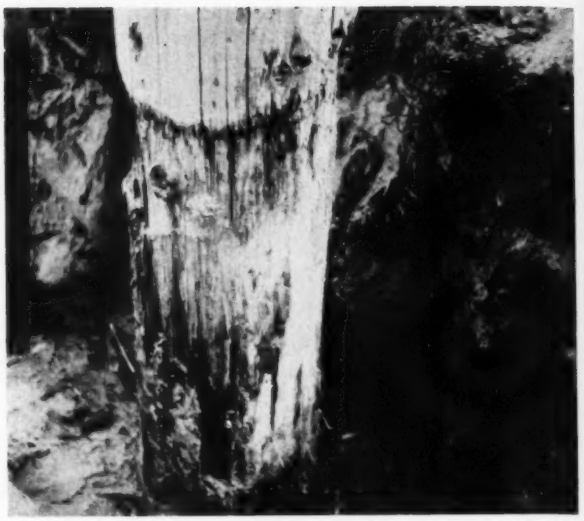
There was still another consideration in the Santa Fe's adoption of the new sections. The previous standard rail sections on this road were the 115-lb and 132-lb RE sections, with which joint bars made in accordance with the AREA standard were used. Because of considerable breakage experienced in these joint bars it was decided to adopt the Rail Joint Company's headfree joint bar as standard.

At the same time the bolt-hole spacing was changed to the AREA standard as adopted in 1948. The change to the Rail Joint Company's headfree joint bars and to the AREA drilling was put into effect simultaneously with adoption of the 119-lb and 136-lb sections. This was done to make certain that joint bars ordered for the new rail sections would have the proper bolt-hole spacing.

Colorado Fuel & Iron Corp. is prepared to roll both of the new sections. In addition, the Inland Steel Company is equipped to roll the 119-lb section at its plant at Indiana Harbor, Ind., and United States Steel is set up to roll the 136-lb section at its Gary (Ind.) plant.

New Lease on Life . . .

An increase of about 12 years in the life of untreated bridge piling is expected on the Northern Pacific following treatment with Osmoplastic material. Process involves removing decay at the ground line, applying a decay-inhibiting substance, then covering with a special heavy paper.



DECAY at ground line on this untreated cedar piling, which has been in service only eight years, is typical.

● Is it economical to buy extended life for bridge piles at a cost of less than 50 cents per year of added life?

Almost any bridge man will say, "Certainly! That's a small price to pay. It costs at least that much per foot just to drive the average pile, let alone the cost of material."

The Northern Pacific figures that 50 cents per year is all that it costs to increase the life of untreated piling in service by an estimated average of 12 years. The road is using a special process, called Osmoplastic treatment, to stop ground-line decay in the piling on many of its branch-line trestles. These piles consist mostly of western red cedar.

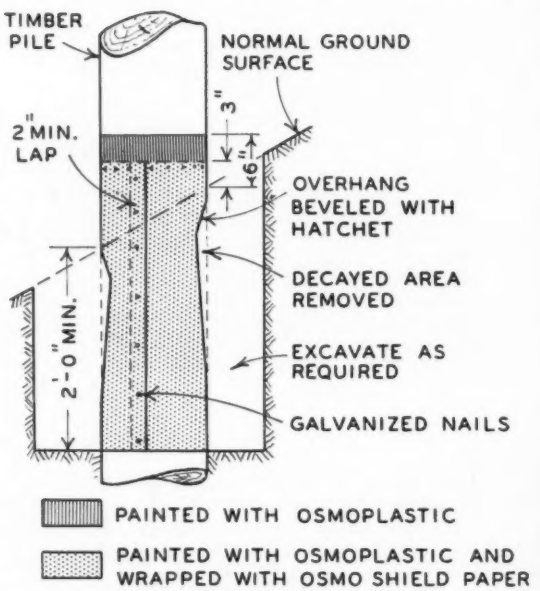
Begins Extensive Program

This year, a program is being carried out for treating 1,200 piles in 27 branch-line bridges. The work is being done on trestles which are not over 10 years old, except in the case of a few rather large trestles where older piles are being treated. The work was limited to piling under 10 years old because it was felt that decay might have progressed too far in older installations. In the case of the large bridges, officers feel that the treatment is worth a try even though more extensive decay is present, since the cost of replacing these structures would be quite heavy.

All branch-line trestles on the road were built with untreated piling up until seven years ago. However, during the past seven years all pile bridge renewals have been made with full-length treated timber.

With the Osmoplastic treatment, the NP feels that it has found an economical means of increasing the service lives of these untreated structures. The process has been used with reportedly good results by several power companies and other industries for over 15 years.

. . . For Untreated Timber



HOW Osmoplastic is applied to a typical pile.

What Is Osmoplastic?

This material is a patented paste-like mixture containing essentially sodium-fluoride, dinitrophenol and potassium bichromate suspended with mineral fibers in a gelatinous coal-tar base.

It derives its name from the fact that penetration into wood is secured through the natural process of osmosis. Osmosis is diffusion that proceeds through a semi-permeable membrane separating two miscible solutions, tending to equalize their concentrations.

In the case of timber, the wood is composed of individual cells with walls consisting of a semi-permeable membrane. The preservative agents (sodium fluoride, dinitrophenol and potassium bichromate) in Osmoplastic are capable of diffusing through the walls of the wood cells, thereby penetrating deeply and protecting the wood from decay. In this process, moisture, usually a major causative agent in decay, becomes a necessary aid to penetration instead of an evil.

Another function of the dinitrophenol and potassium bichromate in Osmoplastic is to serve as protective agents. They provide an anti-leaching zone intended to prevent the unreacted portion of the water-soluble sodium fluoride from dissolving out when the timber is exposed to contagious high moisture. Dinitrophenol, which leaches negligibly, fixes itself to the outer wood fibers, while the potassium bichromate fixes a portion of the sodium fluoride in the wood in a quite insoluble form.

The coal-tar base provides a seal to keep excess moisture, as well as earth, away from the treated surface.

BAD WOOD is removed from piling and the surface is cleaned thoroughly with a wire brush preparatory to being treated.

OSMOPLASTIC is applied with a brush to entire affected area, using approximately 1/6 gal per pile.

Piling in Service

Statements from many of these companies indicate that, using the Osmoplastic treatment, they have been able to increase the serviceable life of power and telephone poles a minimum of about 12 years.

How Work Is Done

In the work on the NP, the first step in treating a particular pile is to use a K & E Swedish increment borer to determine the extent of heart rot, if any. This instrument consists of a small-diameter hollow steel tube which is screwed into the side of a pile until it penetrates the center. When the borer is removed the hollow tube brings with it a plug of wood. Examination of the plug shows the condition of the pile throughout its cross-section. If the heart rot is too extensive, the pile is not treated. The hole made by the increment borer is filled with a treated wood plug.

If the pile is found to be in satisfactory condition for treating, an excavation is made around the pile, extending a minimum of 2 ft below the ground line. All of the decayed material on the surface of the pile is then removed with a special tool, and the surface is cleaned with a wire brush. Osmoplastic compound is then applied to the affected area with a brush, using approximately ⅙ gal per pile. The material is applied to the pile down to the bottom of the excavation, and extending about 6 in above the ground surface.

Treated Area Is Covered

The treated area is then covered with a single layer of Osmo Shield paper from the bottom of the excavation to about 3 in above the ground line. This special heavy paper is provided on one side with a smooth plastic waterproof surface. The paper is so applied that the waterproof surface is on the outside. Its purpose is to keep moisture and earth away from the pile and prevent leaching of the Osmoplastic into the soil. The paper is lapped a minimum of 2 in at the joint, and is held in place by 1-in galvanized roofing nails driven at 6-in centers around the top of the paper, as well as down the joint. After the paper has been secured

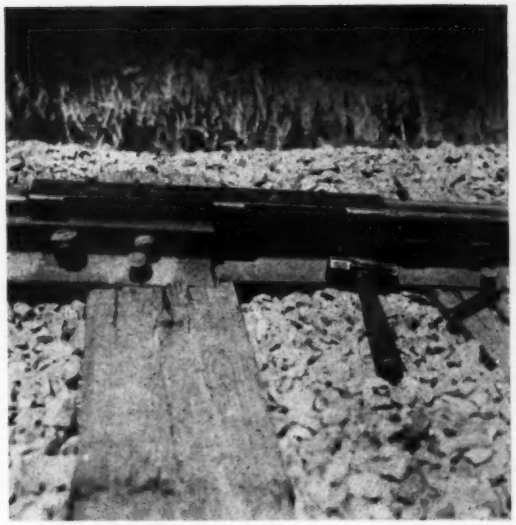
HEAVY PAPER is used for covering treated area to keep excess moisture and dirt away from pile after backfilling.

tightly in place, all rotten wood is removed from the excavation, care being taken that none mixes with the backfill material. The hole is then backfilled to complete the treatment process.

Practice on the NP is to send a bridge gang over lesser-used branch lines every other year to take care of routine maintenance work. Treating of the bridge piles is being carried out by these gangs in conjunction with their normal work. While these maintenance crews are on a particular branch, they will give the Osmoplastic treatment to all untreated piling that are considered sufficiently sound to be treated. Although the NP is using Osmoplastic only on untreated piling, the material is reported by public utility companies to be equally successful in treating creosoted piling which has developed decay at the ground line.

The work this year is being carried out on the road's Eastern district under the general supervision of W. R. Bjorklund, district engineer. Plans call for extending the work to the road's western district next year.

On the Detroit, Toledo & Ironton a problem was presented by the existence of an unsatisfactory joint condition in old 90-lb rail. Cost studies indicated that in-track cropping of the rail would result in a saving of approximately 75 per cent when compared with an out-of-face new rail program.



TEMPLATE for marking location of drill holes is placed on rail, with one end at the rail end. Rail web is center-punched through bossed holes in template.

By Cropping Rails in Track . . .

. . . The DT&I Is Effecting Substantial Economies

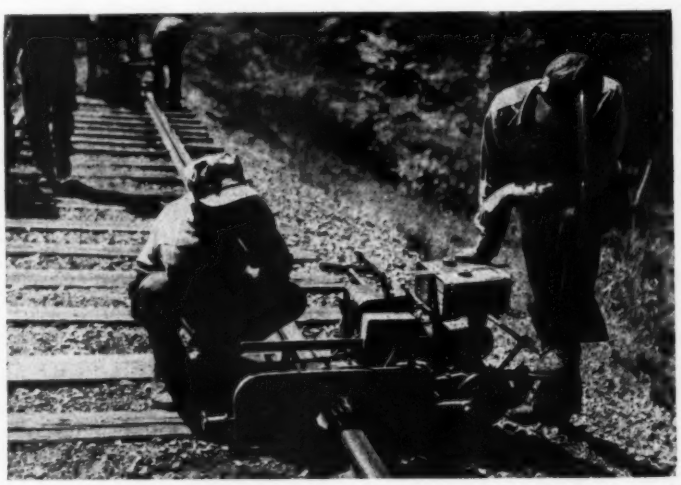
● Is it economical to crop rail in track? The Detroit, Toledo & Ironton believes it is. Last year this road cropped 18.14 track-miles of rail (5,911 rails) in track. An additional 2.96 track-miles (915 rails) were pre-cropped. These pre-cropped rails were used as fill-in rails required as part of the in-track cropping program and as out-of-face relayer rails for use on curves. This year's program calls for the cropping of 37 track-miles of rail in track with all fill-in rails cropped on the ground. The work is carried out under traffic.

The DT&I had a substantial mileage of old 90-lb rail which was afflicted with severe end droop. Application of oversize joint bars and surfacing proved inadequate to correct this condition. The maintenance-of-way budget did not provide sufficient funds to permit immediate renewal of the old rail with new rail of a heavier section. The available stock of relayer rail was insufficient to permit the renewal of any substantial mileage of the old rail with pre-cropped rail. There was no permanent rail-cropping plant on the lines of the road and off-line freight charges for movement of rail to the nearest available commercial cropping plant would have been substantial.

Comparative cost studies indicated that it might prove economical to crop the existing rail in track. Such a program would eliminate the poor joint condition, and the necessary fill-in rails could be supplied from the stock of usable rail on hand.

Another favorable consideration was the fact that the road's low daytime traffic density would per-

INSIDE SPIKES are pulled by a Nordberg hydraulic spike puller after a bolting machine removes nuts from old joints so bars may be knocked off.



CROPPING RAIL with Racine portable rail saws. Four of these machines are operated in a battery, each machine making the necessary two cuts, one at either side of the old joint, before . . .

RAILS ARE DRILLED before cropping. Standard crops of 24 in from ends of 39-ft rails and 18 in from ends of 33-ft rails have been established to provide uniformly cropped rails of 35 and 30 ft respectively.

ANOTHER TEMPLATE, with bosses that fit in bolt holes, is used for locating saw cut. A mark for cut is made across rail head along template's lip.

mit high utilization of working time with a minimum number of closures per day for traffic.

Test Program Undertaken

Accordingly, a trial program was set up and carried out in 1954. The work of cropping the rail was contracted to Lawrence E. Pilot & Sons, Inc., Ardmore, Pa., on a cost-plus-percentage basis. Under this trial program, rail from the usable stock was cropped by sawing at a central location and shipped to the field for fill-in use. A limited quantity of pre-cropped rail was also supplied for out-of-face renewal at locations on curves where the outer rail was severely worn or the inner rail was excessively flattened. The remaining rail was cropped in track. A railway company extra gang was used to surface loose ties and renew the rail on curves with pre-cropped rail.

Comparative Cost Ratios

Out-Of-Face Rail Renewals Vs. Rail Cropping in Track

(1)	Renewing 90-lb rail with new 115-lb rail (estimated)	100
(2)	Renewing 90-lb rail with 112-lb relay rail (estimated) (Usable joints and plates; new bolts, spikes, lock washers and rail anchors)	64
(3)	Renewing 90-lb rail with cropped 90-lb rail (estimated) (Rail purchased outside; new joints, bolts, spikes and lock washers)	38
(4)	Renewing 90-lb rail with cropped 90-lb rail (estimated) (Company rail sent out for custom cropping; other items as in Item 3)	26
(5)	Present 90-lb rail cropped in track, fill-in rails pre-cropped (actual 1954 operation)	23
(6)	Cropping of all 90-lb rail done in track or on location (estimated 1955 operation)	21

. . . LEAPFROGGING, on rail dolly operated on the opposite rail, to start cropping the joint ahead of the other machines. Thirty-eight men plus a foreman and an assistant foreman comprise the contractor's rail-cropping gang.

The work during 1954 cost $6,422 per track mile. This was 23 per cent of the estimated cost of renewing the 90-lb rail out of face with new 115-lb rail. A complete summary of the comparative costs is shown in the table. Items 1, 2, 3, 4, and 6 are based on estimates; Item 5 is based on actual costs. The comparative figures are set up on the basis of 100 for complete out-of-face renewal of 90-lb rail with new 115-lb rail and include all applicable items of expense for new and usable material, labor and transportation, with allowances for salvage credits.

On the basis of experience gained during the 1954 trial operation, a full-dress program was set up for 1955. The work was again contracted to Lawrence E. Pilot & Sons on the same basis. Centralized pre-cropping of rail was abandoned and fill-in rail, and rail for out-of-face renewal on curves, is being distributed to the point of use and cropped on the ground in the

RAIL PULLER is an ingenious device developed by the contractor. With a tie as a fulcrum, one man can literally pump cropped rail into position.

DRIVING SPIKES with an air-operated spike hammer powered from a 105-cu ft compressor mounted on a push car. Laborers, working ahead of spike driver, plug the old spike holes and start spikes.

course of regular work. With this change and other economies in operation, pointed up in the 1954 work, it is estimated that 1955 costs will be reduced as indicated by Item 6 in the table.

Operations in 1955

To insure that defective portions of the rail ends are completely removed, standard crops of 24 in from the ends of 39-ft rail and of 18 in from the ends of 33-ft rail have been established. This results in uniformly cropped rail lengths of 35 ft and 30 ft, respectively.

New 4-hole oversize joint bars, track bolts and lock washers are supplied. Badly worn spikes are replaced with new cut spikes. Rail anchorage is increased from 4 to 8 anchors per rail and worn rail anchors are replaced. The cost of the additional anchors has not been included as an item of job expense.

Fill-in rail, rail to replace worn rail on curves, joint bars and small material are distributed by work train. For fill-in purposes one rail of same length as rail in track is unloaded opposite every ninth rail in track. After cropping, contractor assembles cropped rail ends, joint bars and small scrap into separate piles to be loaded out by M/W work trains with magnet-equipped cranes.

The contractor's rail-cropping gang consists of 38 men plus an assistant foreman and foreman. The foreman center-punches the holes for rail drilling ahead of the work, and then drops back and marks the location of the saw cuts behind the spike-pulling operation. To do this he uses two templates. The first template, the length of which is determined by the length of the crop (18 or 24 in), is placed on the rail with one end at the rail end.

A special center punch is inserted in each of the holes in succession, and driven. This leaves a punch mark on the rail web at the center of the hole to be drilled. The second template has raised bosses that are inserted in the drilled holes and a lip that projects over the top of rail.

A line is drawn across the top of rail, along the edge of the lip closest to the holes, to mark the location of the saw cut.

Unloading Small Material

Two men with a push car follow the center-punching operation. Small material is unloaded from this car, which includes the joint bars, bolts, lockwashers, tie plugs, spikes and additional rail anchors. Next comes a laborer who knocks off the rail anchors. This man drops back in the afternoon to replace anchors behind the bolt-tightening operation.

The rail-drilling operation is next in line. Two drills, a Nordberg rail drill and a Railway Track-work Model P-43 power track drill, each operated by two men, are used in this work. Working at alternate joints, each machine drills the four holes required at the joint, two in the end of each rail to be cropped. These machines are followed in succession by a Nordberg power wrench which removes the bolts in the existing joint and a Nordberg hydraulic spike puller which draws the inside spikes. Each of these machines is operated by one man. The foreman marks the rails for the saw cuts following the spike-pulling. One man knocks off the joint bars and pulls the joint spikes.

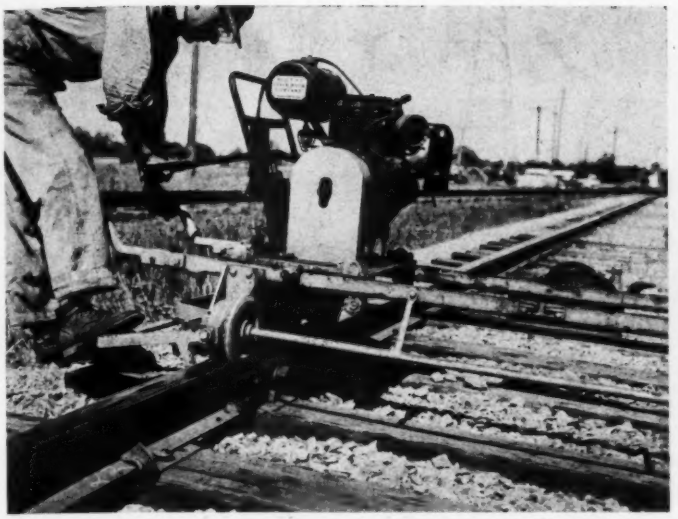
Four Racine Model-15 portable rail saws are used for the cropping operation. Each of these saws is operated by two men. Four joints are sawed simultaneously. The saw at the rear of the operation leapfrogs to the joint ahead of the other saws after completing its cut. When leapfrogging, the saws are transported on a rail dolly, operated by one man, which moves on the opposite rail. When a cut is complete, the cropped end is knocked out and pushed into the side ditch or onto the shoulder. The fill-in rails are cropped and drilled in order, in their position in the side ditches or on the shoulder, and are moved to the track as required with rail tongs.

Unusual Rail-Pulling Device

The rail-pulling operation, to close the gap between the cropped rails, is under the direction of the assistant foreman.

The rail puller, an ingenious device developed by the contractor, is operated by one man. It is made up of four parts. The first is a two-tined fork mounted on a long pipe handle, the tines of the fork being spread sufficiently to straddle a rail.

The second part of this device consists of a bar, pivoted to the heel



SLOT-GRINDING rail ends with Railway Track-work rail-joint cross and surface grinder is one of the duties of a small follow-up gang that also gathers and piles scrap to be loaded out by work train and . . .

. . . FILLS RAIL JOINTS with Texaco 904 joint lubricant with the aid of a Lincoln lubricator outfit mounted on push cars.

of the fork, and bent downward for the outer third of its length.

Two bars, each bent in the shape of a "hasp hook," are pivoted at and suspended, like inverted question marks, from the outer third point of the first bar, with the open ends of their hooks facing each other.

The remaining section of the rail puller consists of a tension spring which connects the bent-down end of the first bar with the top of the hooks of the second bar.

When in use, the tines of the fork are pushed into the ballast adjacent to a tie and astride the rail. The tie acts as a fulcrum during the rail-pulling operation. The hooked portions of the suspended bars each enclose one side of the rail head. The dragging action, created as the fork handle is pulled forward, causes the hooks to pivot and lock around the rail head. As a result the rail is dragged forward as the handle is pulled. When the limit of the forward stroke is reached, the fork handle is pushed backward. Since the drag action is reversed, the hooks release their grip on the rail. The tension spring prevents the hooks from dragging and re-engaging the rail on this return movement. As a result, the rail is literally pumped into place.

Two laborers assist in the rail-pulling operation. They place the expansion shims at the rail ends and spike the rail to steady it until the spikers arrive. In addition the three men lift the fill-in rails from the ditch or shoulder, one end at a time, and position them as required.

Finishing Operations

Two laborers follow up the rail-pulling operation. These laborers place the joint bars and finger-tighten the bolts. A Nordberg power wrench, operated by one man, then tightens the bolts.

The bolt tightener is followed by a group of seven laborers. One plugs the old spike holes; one places plastic plugs of Texaco Plastic-H in the ends of the joint bars; one replaces the rail anchors (this is the same man who removed these anchors in advance of other operations); and four laborers who set and start the spikes for full spiking.

Next in line is a 105-cu ft air compressor mounted on a push car coupled to a track motor car. This air compressor powers a spike driver which is used to full drive the inside spikes which have previously been started. Two men are required to do this driving and handle the track-motor-car-push-car combination. It is also used to handle tools, materials and additional fill-in rails when job conditions so require.

Follow-Up Gang

The contractor furnishes a small follow-up gang of five men which operates some distance behind the rail-cropping gang. These men alternate between gathering and piling scrap and other material for the work train to pick up cross grinding joints and filling the joints with lubricant.

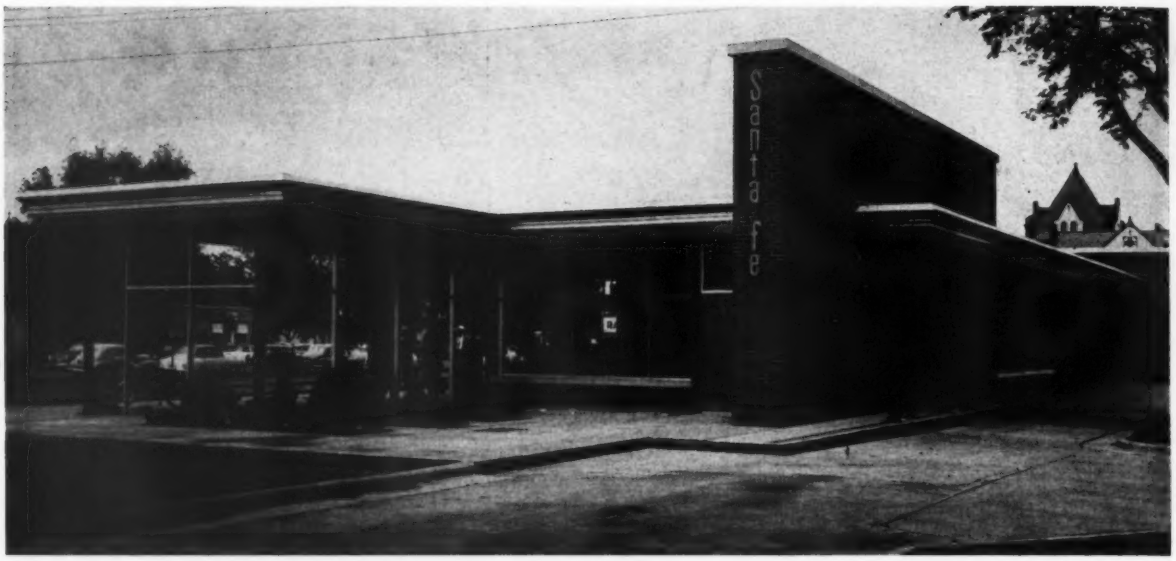
In this gang, two men operate a Railway Track-work Model P-38 rail joint cross and surface grinder which is used to slot the rail ends and remove irregularities from the tops and sides of the rail heads. The other three men operate a Lincoln lubricator outfit used for filling the previously plugged joints with Texaco 904 joint lubricant. The lubricator equipment is mounted on two push cars one of which carries the barrels of lubricant while the other carries the Lincoln lubricator. A track motor car is coupled ahead so that the equipment may be readily moved to the point of work.

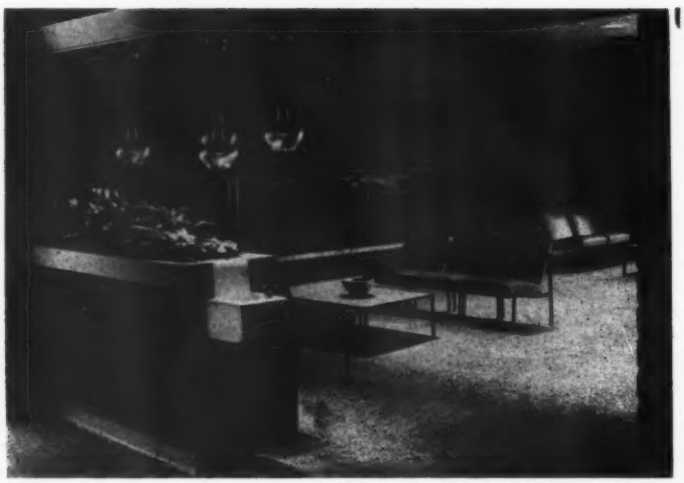
When applying the joint lubricant, two men punch holes in the plug at the end of the joint and insert the lubricator pipes for filling the inner space under pressure. The applicators are then withdrawn and the holes are plugged with Texaco Plastic-H by the third man.

Flag protection is provided by DT&I M/W forces and a DT&I section force or extra gang follows up the cropping operation performing necessary surfacing and lining operations.

The gang works a daily 8-hr shift and crops an average of 75 to 80 joints per day. On the day that operations were observed, the gang cropped in excess of 100 joints.

The rail-cropping work is being carried out under the general direction of C. L. Towle, chief engineer, and H. W. Seeley, engineer maintenance of way, DT&I. The contractor's superintendent in direct charge of the work is H. T. Matthews.





CLASSIC DESIGN of new Santa Fe station at Hutchinson, Kan., provides both beauty and comfort, in addition to functionalism. Located in a grove of large trees, the new layout provides planting areas along the platform to carry out the suburban aspect of the setting. The building is of steel and brick construction with a built-up tar-and-gravel roof over precast and prestressed concrete slabs. Large window areas and canopies add considerably to the apparent size of the structure. Interior of waiting room (left) is designed and furnished in a club-like décor with exposed brick walls, walnut paneling, terrazzo floors, artistic lighting, planting boxes and a wood-burning fireplace.

News Briefs in Pictures . . .

SCALE MODEL of Frisco's new $10 million yard now under construction at Capleville, Tenn., near Memphis, shows complete layout of the road's first gravity-switching yard. The new facility, replacing a flat-switching yard at Yale, Tenn., is to be located on a site of more than 300 acres. It will feature electrically-operated retarders, one a 198-ft master unit and five 99-ft group units. Fifty classification tracks divided into 10-track groups will provide capacities ranging from 30 to 53 cars with a total capacity of 1,938 cars. Additional trackage will include four drill tracks with capacities of over 160 cars and an inbound yard consisting of seven tracks with capacities ranging from 150 to 166 cars. Mechanical facilities will comprise a diesel repair and service shop with five tracks, offices and wash and locker rooms. A car repair yard will provide rip tracks under the cover of a full-span steel shed 80 ft by 500 ft. An adjoining building 20 ft by 500 ft will house various shops and offices.

CONTROL of BRUSH
with Chemical . . .

. . . IS FAST BRINGING BRUSH KILLER TO THE POSITION OF CHEMICAL WEED KILLER, WHERE ITS USE BECOMES AN IMPORTANT PART OF THE YEARLY MAINTENANCE PROGRAM OF MANY RAILROADS.

Each year as our railroad accounts repeat on their weed control program, many of them follow up weed killing work with brush control work.

Many of the large spray trains that we utilize in contract work, complete the weed killing work and go right over on the same railroad to the distribution of brush killing chemical. It is practical to continue such work until frost is pending.

If the cost of mowing and removing brush impresses you as prohibitive, consult with us as to the cost of chemical control. Or make a date to ride one of our brush control spray trains. The data we have accumulated in working for many railroads is available for your study.

READE EST. 1885

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WHAT'S THE ANSWER? . . .

. . . a forum on track, bridge, building and water service problems

Cleaning Screen of Deep Wells

When the screen of a deep well becomes clogged or choked with sand, what measures may be employed to clean the screen and restore the flow of water? Explain.

Clogging Due to Incrustation

By H. E. Graham
Superintendent Water Service,
Illinois Central, Chicago

The screen of a deep well usually becomes clogged due to incrustation. However, sand may enter the well and choke the screen by collecting on the inside and filling the lower portion of the well.

Incrustation is the deposition of minerals on the screen and in the surrounding formation. This is usually caused by the change in pressure that takes place at the well screen.

When a well screen is subject to incrustation, reducing the rate of pumping will reduce the pressure differential and the tendency to incrust. If it is not practical to reduce the pumping rate, then the screen will have to be cleaned periodically by removing the deposits.

Inhibited muriatic acid, gently surged, is usually very effective and can be used provided the screen is constructed of an acid-resisting material.

The acid is placed in the screen through a small pipe from the surface and allowed to remain there approximately two hours before the surging operation is started. After the well is surged for several minutes, the acid is allowed to stand for another two-hour period and then the well is bailed or pumped clean. If the acid treatment fails, the screen will have to be removed and cleaned mechanically.

Wearing or corroding of the screen slot to an over-size dimension will permit the sand it formerly retained to enter the well. When sand collects inside the screen, it chokes off the lower portion. This causes an increased velocity in the remaining portion of the screen, thus accelerating the tendency to widen the slot and allow still more sand to enter the well. If detected soon enough by visual examination of the water at the pump discharge, it is sometimes possible to correct the condition without pulling the screen. If the water-bearing structure to which the screen is exposed contains enough coarse material, the inside of the well may be cleaned of sand and redeveloped. This will pull the fine particles out of the area around the screen and will give the effect of a gravel-packed well. If the sand is of uniform size, screen replacement may be necessary.

If sand has been pumped through the screen for a long period of time, collapse of the stratum above the water-bearing formation may occur causing the well to fail completely.

Hair Cracks in Concrete

What causes hair cracks to form on the surface of concrete? Are these cracks detrimental? How can they be avoided? Explain.

Answer Essentially Empirical

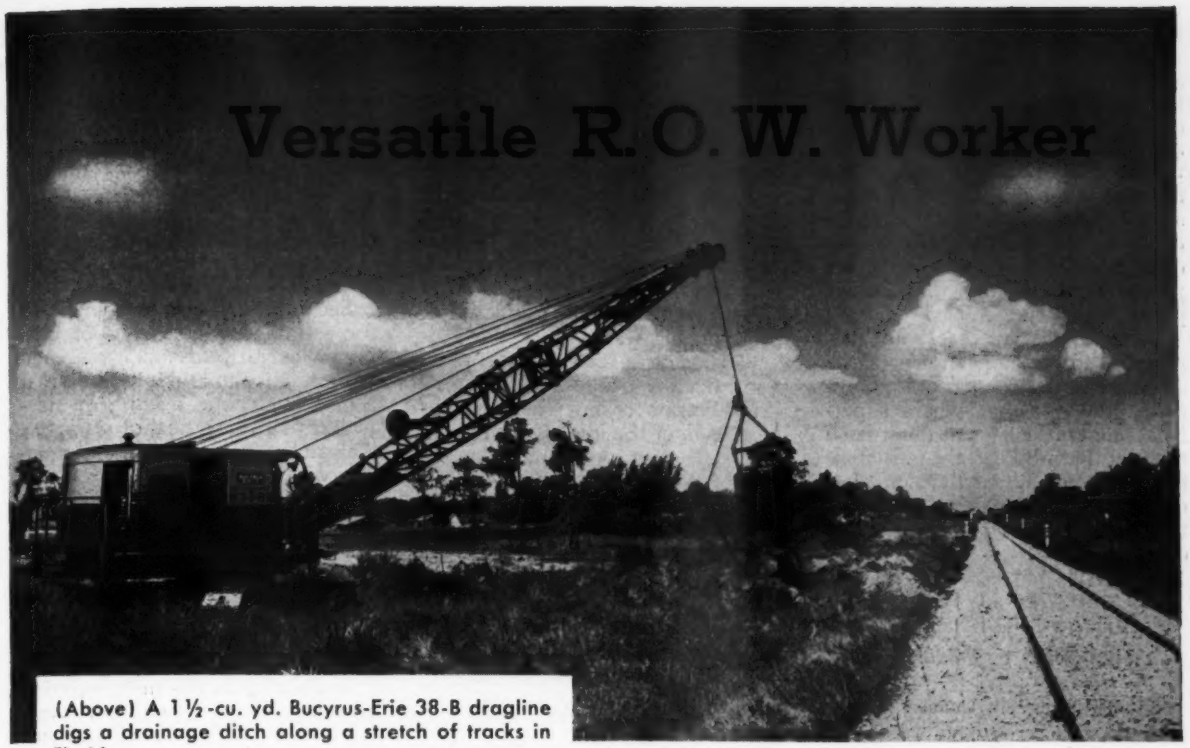
By H. M. Tremaine
Retired District Engineer,
Northern Pacific, Spokane, Wash.

The answer to this question is essentially empirical.

There are two reasons for the formation of hair cracks on the surface of concrete. The second reason is really supplemental to the first. These reasons are: (1) A surface mixture which is richer in cement than the main mass of the concrete; and (2) contraction of the exterior surface from any cause, i.e., quick temperature changes or variations in the mix.

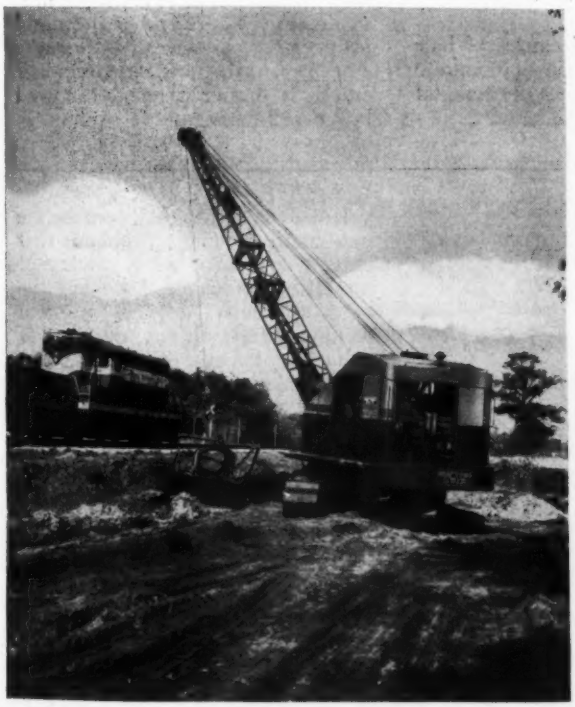
The failure to provide contraction joints may be a contributory but is not a prime factor in the production of hair cracks.

The first and controlling reason for hair cracks is almost wholly the result of improper spading of the concrete. This results in a larger proportion of cement in the surface of the mix than in the remainder of the mass. As a result, there is a difference in the coefficients of contraction, and/or expansion, in these two parts of the structure. The development of hair cracks in the surface may be forestalled by proper placing of the concrete and care in applying the fine finish after the forms are stripped. Objectionable hair cracks are commonly found in structures which were poured in conformance to specifications which were in vogue not too many years ago. However, present specifications do not permit the application of a rich cement surface and if these specifications are followed they minimize segregation and concentration of grout at the surface of the mixture. As a result, formation of hair cracks in structures fabricated according to modern practice are largely avoided if the specifications are properly followed.



(Above) A 1½-cu. yd. Bucyrus-Erie 38-B dragline digs a drainage ditch along a stretch of tracks in Florida.

(Below) This ¾-yd. Bucyrus-Erie 22-B dragline is working on construction of a roadbed in South Carolina.



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The second reason may be regarded as purely contributory. Contraction joints (not expansion joints as they are sometimes identified) are found in such construction as tunnel lining, retaining walls, walls, footings, copings, etc. All of these structures are affected by contraction during the setting of the concrete and if contraction joints are properly placed they will aid in the prevention of hair cracks.

In the main, hair cracks are detrimental to the appearance of the structure only. There are exceptions, however, but where superficial hair cracks have at times been thought harmful to the structure the writer has found that, on thorough investigation, the source of the harm sprang from deeper causes.

Five Rules to Observe

By Harry B. Cundiff
Instrumentman, Missouri Pacific, Jefferson City, Mo.

Hair cracks or "crazing" is believed to be due to volumetric changes in the constituents during the setting and curing of concrete. These changes in volume may be due to differences in temperature and water content throughout the mass.

Hair cracks may not materially affect the strength of the concrete but they do seem to provide an inroad for the accelerated deterioration of the surface where it is exposed to frost action.

Hair cracks can generally be avoided by more careful controls in the mixing and placing of concrete if the following rules are observed:

(1) Use of the proper amount of mixing water.
(2) Use of as lean a mix as practicable.
(3) Proper curing (the prevention of the loss of mixing water and keeping concrete within the recognized suitable temperature range).
(4) Avoid too much troweling of the surface (inexperienced finishers working for a lick finish often get sorry results).
(5) Use of as coarse aggregates as will give a good mix.

Caused by Improper Methods

By L. P. Drew
Assistant Chief Engineer, Union Pacific, Omaha, Nebr.

There are several causes of hair cracks on the surface of concrete and all are more or less detrimental to the quality of the concrete.

The first and most common cause is improper curing of the concrete. In this case curing is usually too fast, so that water is removed from the surface before complete hydration of the cement in the interior has been accomplished. Hair cracks then result from contraction or shrinkage of the surface without corresponding contraction in the interior.

Second, the use of too rich a mix for topping or surfacing of concrete. Several years ago it was common practice to add a topping coat ½ or 1 in thick as a finish on sidewalks, platforms, tops of piers, etc. This rich mix would not bond properly with the main body of the concrete and, therefore, being nonhomogenous it had a different rate of expansion.

The third cause, very common 35 years ago when a very wet mix was considered proper, is the use of too much water with the result that water is brought to the surface or is worked up to the surface during finishing. This non-uniform working of the concrete results in surface cracks.

Hair cracks in concrete can now be avoided by using standard methods of mixing, placing and curing. Their chief cure is proper mix, use of the water-cement ratio and proper proportioning of aggregates. The next safeguard against hair cracks is proper placing, followed by proper curing.

Adequate Depth of Ballast

What factors determine the minimum adequate depth of ballast under track? Does this vary with different types of ballast material? How? Why? Explain.

Three Primary Factors

By J. E. Eisemann
District Engineer, Gulf, Colorado & Santa Fe, Galveston, Tex.

Proper drainage, cushioning and stability of foundation are the primary factors which should be considered when answering this question. However, there are so many facets to each factor that the subject can only be touched upon briefly in an answer such as this.

In addition, there is a great difference in whether we are talking about the recommended ballast depth at the time of new construction or the ultimate ballast depth one will eventually obtain, from a planned series of raises over a relatively short period, following construction. If we are speaking of a ballast depth under track which has been in service a great many years, about all that could be considered would be the ballast which would be placed under track at the time of any current surfacing program. Any ballast under the ties, prior to the surfacing program, would be so foul that it would give very little drainage benefit and it would not add much to the cushioning effect. However, such fouled ballast would add to a stable track foundation through its stabilizing effect on the subgrade soil.

However, rather than confuse the issue with the many problems that enter the picture when talking of established trackage, I believe the best approach to the question would be through consideration of ballast depths on new construction.

The main item to be considered is the general subgrade condition in a particular area. What is most required of ballast? Is it drainage, cushioning or an effort to help stabilize an otherwise unstable soil condition?

If it is drainage, do you want complete porosity of ballast—do you want the moisture to drain freely to the bottom of the ballast section and then run off on either side across the top of the subgrade? Or, do you desire that the moisture be shed before it can penetrate the ballast section—do you want to prevent saturation of a subgrade that has too great an attraction for water? In the first instance, we would consider crushed rock, slag, volcanic cinders and gravel as ballast ma-

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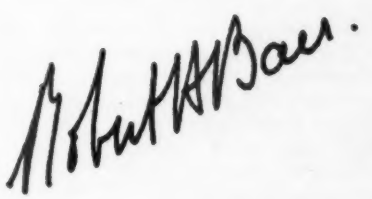


terial and the absolute minimum depth of ballast under the tie should be eight inches, while a preferred minimum depth would be ten inches. In the second case, a preferred minimum depth would be six inches.

If drainage, or a stable foundation, is not of controlling importance in an area, but cushioning is to be given prime consideration, as might be the case where track passes through a solid rock cut or over fills made of excavated rock, a desirable minimum could be 10 in, while a preferred minimum would be 12 in.

If the subgrade foundation has been constructed of relatively unstable material, one has a situation that requires the utmost attention. In such a case, the soil would have a very great affinity for water, and, if the coarser grades of ballast material were used, the natural attraction of the soil for water would not be lessened nor would water be diverted from the subgrade area.

In this case, one would want to be assured of a maximum distribution of bearing load, over such subgrade soil, as transmitted through the ballast section. About the only manner in which this could be accomplished would be through use of a maximum ballast section of such a depth that construction economy would not permit you to consider its use. A more practical solution would be found either through use of a satisfactory topping material on the subgrade, or through initial use of one of the finer grades of ballast material, such as chat or screenings, applied to a minimum depth of 6 in and followed, after a settlement period, by an application of a coarser grade of ballast to a minimum depth of 8 in. The finer material would serve to insulate the subgrade insofar as the ballast section is concerned and would change the consistency of the subgrade soil. This would minimize, to the greatest extent possible, the acceptance of additional moisture by the subgrade and would go far towards minimizing capillary pumping action with reference to moisture already contained in the subgrade.

While varying traffic conditions definitely enter the picture, the above should be qualified as statements which would apply to a railroad having a potential traffic density of from 10 to 15 million tons annually.

Preventing Winter Heaving of Track

Is the use of salt to prevent or reduce the winter heaving of track practical? If so, when should it be applied? How? What, if any, restrictions should be observed in its use? Explain.

Chemicals Will Prevent Heaving

By E. S. Shandrew
Extra Gang Foreman, Southern Pacific, Oakland, Cal.

Even at severely low winter temperatures the use of chemicals can keep in liquid form the underground water that would cause heaving. As long as this underground water does not freeze it does not swell the ground and cause the track to heave. Chemicals such as either common salt or calcium chloride will prove about 90 per cent effective if proper application is made early in the fall. The chemical is applied at the ties which heaved the previous winter.

At first thought this might seem to be an expensive measure. As a matter of fact, where heaving occurs it usually affects only a small group of ties, sometimes not more than one or two. Only the tie ribs immediately above the water pocket which would cause heaving need to be treated with the chemical.

In order to substitute chemical treatment for shimming, information must be on hand as to the exact ties which heaved the previous winter and the thickest shim that was required at each run off. The general practice is to apply a layer of salt as thick as the height of the heave to the crib of each tie where heaving occurred, that is, a layer as thick as the thickest shim used at that spot the previous winter.

A lighter layer of salt should be applied to one or two adjacent cribs on each side of the high spot to feather out the treatment. It is best to extend the layer of salt to the toe of the ballast.

Either of two methods may be followed in mixing the salt with the ballast. One is to apply it on top of the ballast and then stir it into the ballast by the use of picks. The other is to dig out the crib to the bottom of the tie, and then apply salt, after which the crib is filled with ballast.

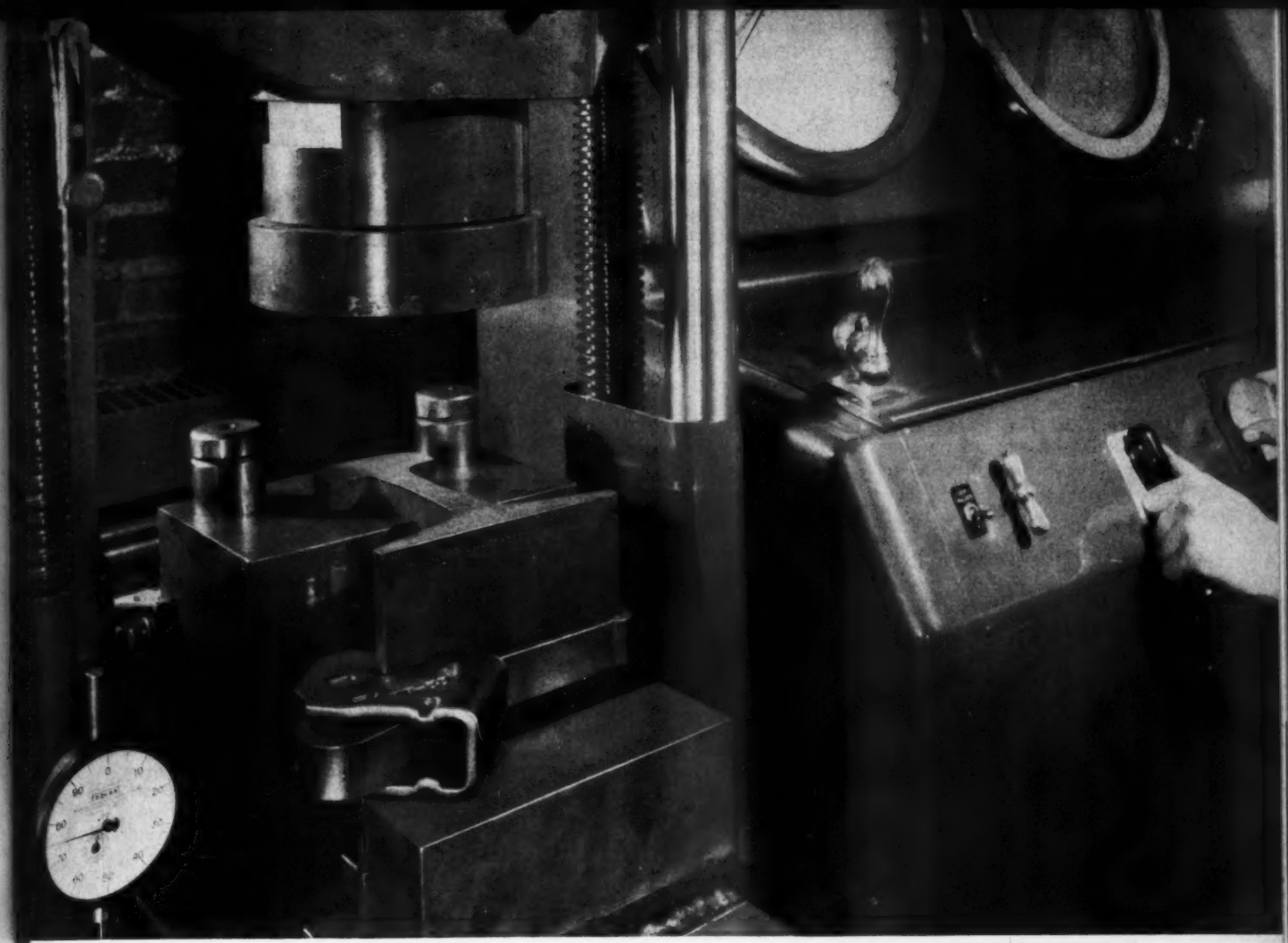
The proper proportioning of salt used is important. In regions where frost does not penetrate more than a couple of feet the application of too much salt would not be particularly objectionable except for the cost of wasted material. However, where all ground freezes to a depth of 5 or 6 ft, there is some swelling everywhere. Consequently the application of salt should be just sufficient to equalize the heaving of the bad spot with that of the adjacent track. If all freeing in such a location is eliminated, the bad spot will appear as a low spot during the cold weather and then the salted ties would have to be shimmed.

Use of Salt Is Practical

By Roadmaster

The use of salt, or other chemicals which lower the freezing point of water, is entirely practical as an aid in the reduction of heaving track in winter. Obviously, however, there are certain restrictions which must be observed in their use. For instance, their use should be avoided at locations where track circuits are in operation as these chemicals will act as electrolytes, thus increasing the conductivity of the soil, possibility resulting in signal failures. Also they should be applied to the roadbed in such a manner that they will not cause corrosion of rail and track fastenings.

The heaving of track is caused by the freezing of free water in the roadbed and ballast. This freezing results in what are known as "frost boils" which are the active heaving agent. Frost boils can be prevented in two ways, by drainage or by reducing the freezing temperature of the water, which causes them, below that of the surrounding ground. Proper drainage is, of



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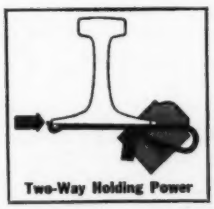

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course, the best preventive measure. However, there are frequently short locations in track where the installation of track drainage is unwarranted. In such locations the use of salt or other chemicals to prevent track heaving has distinct advantages.

The treatment should be applied in the fall, prior to the fall rains and before the first freeze-up The locations which need treatment are usually well known to the section foreman. The extent of the spot should be marked out during the preceding winter while the track is heaving or before shims are removed in the spring. This is so that the length to be treated can be readily identified when the time comes to apply the chemical.

When placing the salt, or other chemical, the ballast should be stripped down to the subgrade in the tamping zone and out to the end of the tie. The salt should then be spread on this exposed subgrade at least as thick as the maximum shim used the preceding winter. This salt should be thoroughly mixed with the subgrade material with the aid of picks, shovels or tamping bars. Following the application of the salt, the ballast should be replaced and the track thoroughly tamped.

Usually, one application will correct the heaving tendency at one location for about two seasons after which it will be necessary to treat the roadbed again. However, the saving in labor required to shim track over these locations will more than repay the cost of application of the chemical.

Encasing Steel H-Piles

What, if any, effective method exists for the encasing of steel H-piles with concrete before they are driven? Explain.

Not a Common Practice

By A. H. Gustaferro
Railway Representative, Structural & Railways Bureau, Portland Cement Association, Chicago

Encasement of steel H-piles with concrete before they are driven is not common practice. The purpose of encasing steel piles is to protect the steel against corrosion when piles are in water. Piles are generally encased after they are driven and there are several satisfactory methods of doing this.

In certain cases, it may be advisable to encase the piles before they are driven. On a recent Pacific Coast project, piles with 12-on-5 batter, 115 ft long, were encased by shotcreting. Loose scale was first removed from the piles by light sand blasting. Galvanized wire mesh, No. 12 gage (2 in by 2 in), was formed into a cage. This mesh cage was held out ⅝ in from the steel H-pile by ¼-in steel rods which were crimped at 16-in centers and spot welded to the piles. Next, the mesh was tied to the piles. A total thickness of 2 in of shotcrete was applied in two stages. The mix was one part cement to four parts sand and the resulting concrete tested 5,000 psi at 7 days. Piles were successfully driven without spalling of concrete.

Programming Routine Section Work

In many present-day reorganizations of track-maintenance forces, section gangs as such have been reduced to skeleton organizations. Under these conditions, is it practical to program routine section work? If not, why? If so, what are the advantages? Explain.

Routine Work Not Programmed

By L. T. Nuckols
Chief Engineer, Chesapeake & Ohio, Richmond, Va.

Until about four years ago, our section forces would average one foreman and six to eight laborers assigned to the maintenance of about 10 to 12 miles of main track. These section forces were expected to perform not only spot work such as smoothing joints, installing switch ties, opening up drainage ditches, etc., but also, to a somewhat limited extent, out-of-face surfacing, including installation of crossties.

A part of this work, such as out-of face surfacing, tie installation and bolt tightening could be programmed. However, spot tamping, cleaning culverts, station-ground maintenance and other work of this nature, the necessity for which became apparent from day to day in relation to traffic and weather conditions, could not in every case be anticipated and was not programmed.

About four years ago our forces were reorganized with the view of performing all out-of-face track maintenance work with large mechanized gangs, assigning only routine work to the section forces. At that time the length of sections was extended to include, on the average, about 16 to 18 miles of main track, and the section force was made up of one foreman and three laborers.

With this skeleton organization we made no attempt to program any of the routine section work, as we did not consider this practical or desirable. This small force was assigned to inspection of track and the light repairs necessary to maintain satisfactory track conditions. These repairs consisted mainly of spot tamping and smoothing joints, tightening bolts and opening drain pipes and ditches. Due to the size of these section forces they could not perform such work as unloading cross ties and ballast in advance of surfacing, installing switch ties or any other heavy work which section forces would normally be expected to perform. Primarily they did track-patrol work.

After two years' experience with this type organization it was decided that the out-of-face work with large mechanized forces would be limited to surfacing

(*Continued on page 66*)

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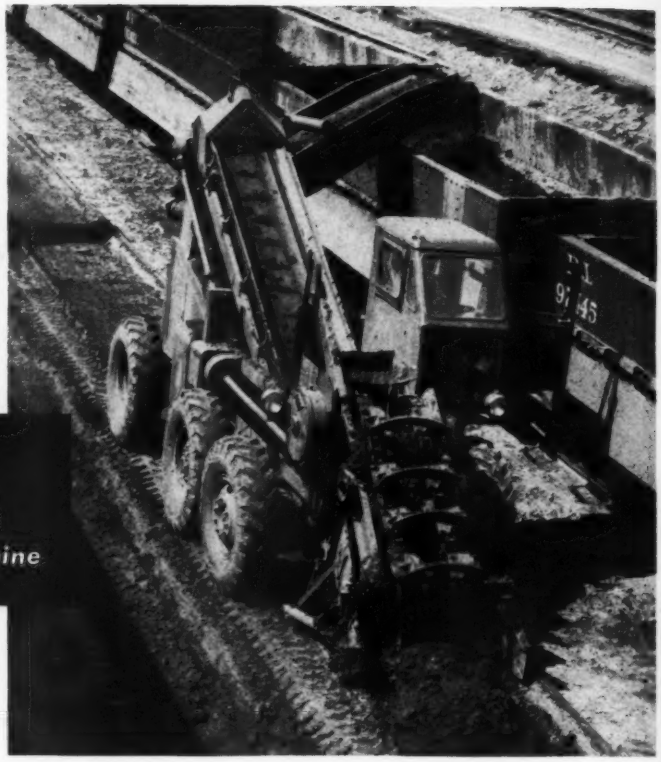

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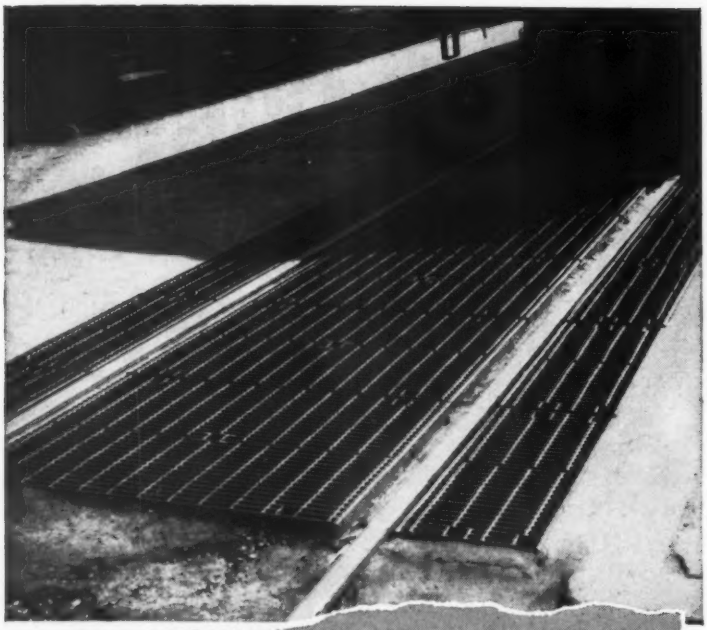

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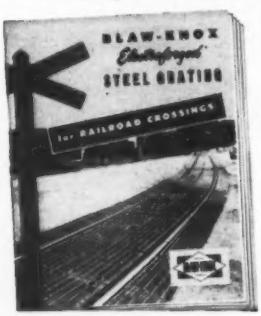

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What's the Answer (Cont'd)

(*Continued from page 62*)

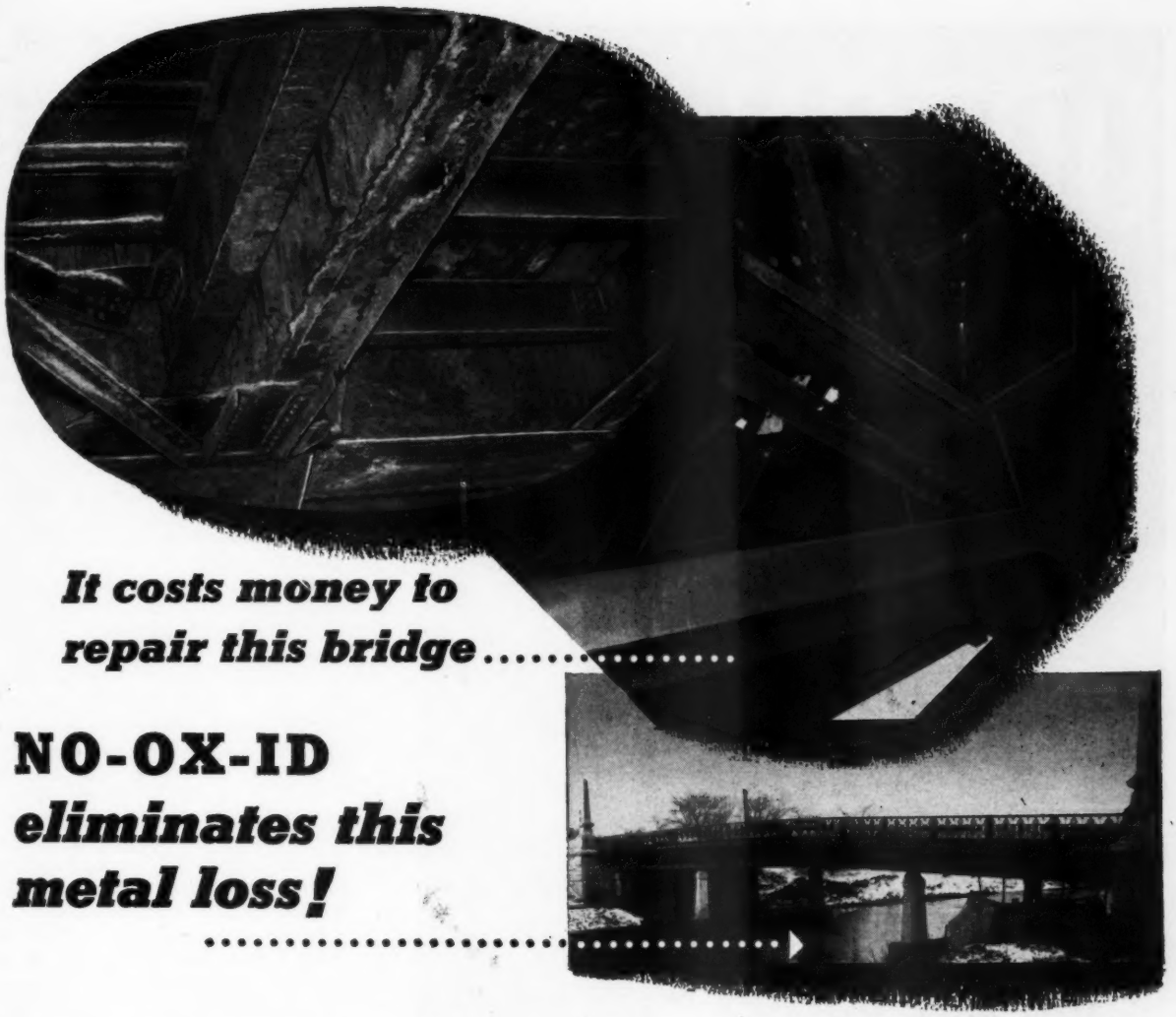
track, installation of crossties, and laying of new rail. It was further decided to increase the size of our section forces to the extent that they could handle not only the routine work but also such work as unloading crossties and ballast, tightening bolts, installing switch ties and, to a limited extent, the laying of relay rail. This reorganization was accomplished by the consolidation of adjacent sections and the extension of section limits. This new type force consists of 10 to 12 men and covers sections 20 to 45 miles long, and is equipped with highway transport in addition to track motor cars. We have found that a part of the work assigned these larger section forces can and should be programmed. The routine section work, however, does not lend itself to advance programming.

Provides a Clear Picture

By N. F. Alberts
General Track Foreman, Chicago, Milwaukee, St. Paul & Pacific, Chicago

The programming of section work with a skeleton gang of two, three, or four men places a clear picture in front of the foreman and enables him to dispose of the various operations in a systematic manner. The general appearance of the right of way and the responsibility for the near appearance of the railroad property rest solely on the foreman. The number of chores on a section and the responsibilities of a section foreman are greater in number today than ever before. Since his forces are limited the programming of routine section work has a greater advantage than a program for a larger gang.

The first consideration in developing a program is the character of the sections involved. These territories fall into four general classifications, namely, main line, secondary line, branch line and yard sections. Traffic conditions affect the possibility of getting over a particular section territory and to attend to the various jobs of work to be done without interference with train movements. For example, main-line sections where there are switch lamps to care for, switches to oil, railroad and highway crossings to inspect and other complicated lay-outs which require attention at frequent intervals offer an



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What's the Answer (Cont'd)

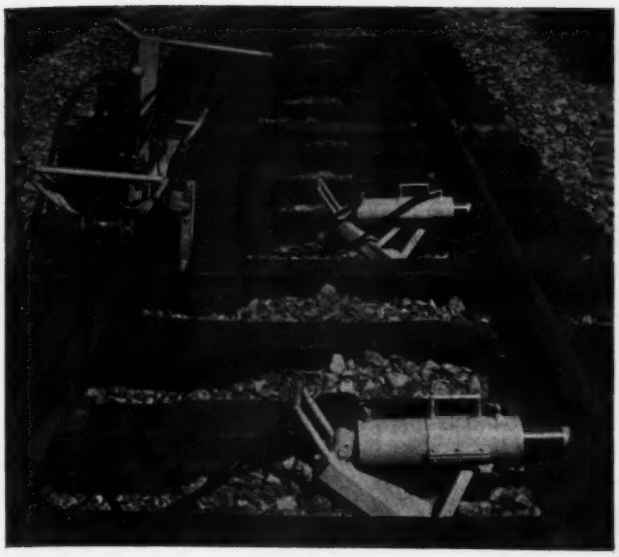
opportunity for the foreman to give careful study to train schedules and, by programming, to take advantage of the time available, between train movements, to cover the various chores on his section.

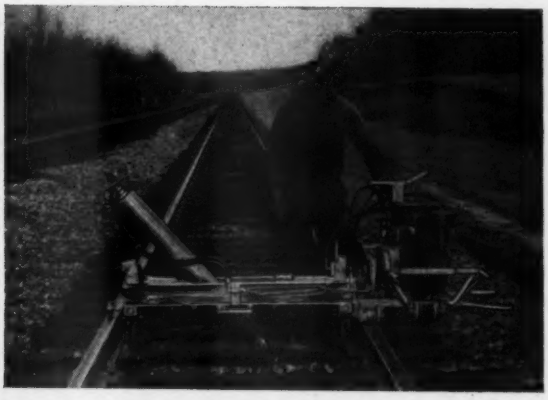
Some railroads have adopted a system in which a track inspector is charged with the responsibility of patrolling or inspecting tracks. This is the proper thing to do if the man assigned is capable of detecting conditions in general. Other railroads use a track inspector and a helper who in addition to patrolling or inspecting the track, take care of switch lamps, oil switches and make occasional light repairs. Either one of these systems have great merit and should be encouraged on other railroads that still spend much time patrolling track frequently with section gangs as they did many years ago. A track inspector for every 50 to 60 miles of railroad would be a great gain. He would report conditions found to the track supervisor or roadmaster and keep the foreman posted on matters requiring immediate attention. The section foreman, being relieved of this responsibility, can then devote the larger part of his time and that of his gang to track matters and other chores on his section.

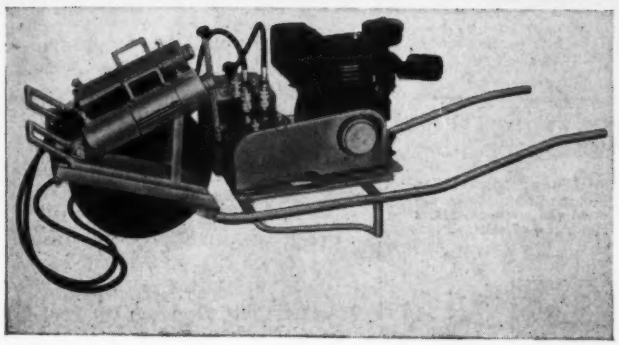
It seems to me, however, that the matter of inspecting or patrolling tracks is getting too wide attention on railroads today. With better materials, with better stabilization of roadbed, better installation of rail, ties and ballast, better anchorage and all that goes for making a good sound railroad. The patrolling of tracks should be held down to a minimum.

Too frequent track inspection by a section crew means less productive work. Unless a line is subject to slides or other known bad conditions, such as rail subject to failures, etc., the inspection of a high-class main line should be held down to about twice weekly. Secondary or branch lines having a fairly good roadbed, good rail, ties and ballast should be inspected once each week, also yard leads, where heavy switching is being done, interlocking plants and other complicated layouts.

These inspections are the responsibility of the foreman himself, and not of the ordinary laborer. When the foreman detects conditions which need correcting he can assign the men required to make







Upper left—Model P-O, gasoline engine powered Hydraulic Track Liner operating two hydraulic rams.

Upper right—Model P-O gasoline engine powered Hydraulic Track Liner operating attachment with double flanged track rollers, adjustable for any height and weight of rail.

Lower left—Model P-O gasoline engine powered Hydraulic Track Liner and two hydraulic rams mounted on wheelbarrow type frame that can easily be operated or transported by one man.

Lower right—Model H-O Hydraulic pump, light weight, hand operated, that will supply power for one (as shown) or two rams. Ideal for small gangs.

RTW HYDRAULIC TRACK LINER

More track lined per hour with Minimum effort and expense

The RTW Hydraulic Track Liner—Model P-O—was devised and designed by railroad engineers thoroughly familiar with maintenance of way problems.

A light rigid self contained attachment with double flanged rollers used with the P-O Track Liner adjusts to any height or weight of rail. It supports a portable air-cooled 8 horsepower gasoline driven engine. This power plant can be used with two hydraulic rams for lining thru switches, road crossings, etc., as well as supplying power for the attachment for out-of-face lining. Its light weight and portability reduces operator fatigue.

This equipment is also available mounted on a wheelbarrow type frame that can be transported by one man for use in heavy traffic areas.

The hand operated hydraulic pump, available with either one or two hydraulic rams, is ideal for spot lining with small gangs.

The interchangeable units of these highly portable power operated Hydraulic Track Liner combinations afford a smaller force, the equipment necessary to do the work that normally would require heavier oversized machines and a large crew.

Write for complete details today

Railway Trackwork Co.

3207 KENSINGTON AVE., PHILADELPHIA 34, PA.

TRACK MAINTENANCE MACHINERY

Rail Grinders • Switch Grinders • Cross Grinders • Surface Grinders • Rail Drills • Ballast Extruders • Bit Sharpeners • Tie Nippers • Grinding Wheels • Cut-off Wheels • Track Liners

There's a SIMPLEX JACK to Do Every RAILROAD JOB Faster-Easier

Fast Acting TRACK JACKS

15 ton capacity. The jacks set much more firmly and stand straighter under tie (without damage) or rail, due to large area toe lifts. Trip from either side. Two models have light weight aluminum housings.

ALSO: Tie removers and replacers.

Standard Speed BRIDGE JACK

The new A2515 25-ton jack has an aluminum alloy housing, which weighs only 40 pounds. 9-in. lift eliminates re-setting in bridge work. Recommended for use with jack support.

ALSO: A complete line of hydraulic jacks and pullers.

Versatile BRIDGE JACK

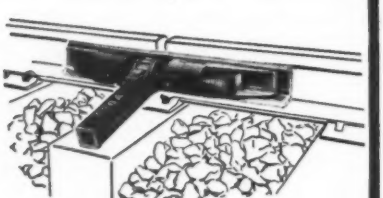
Lifts, pushes, pulls 15-tons on cap, toe or bolt attachment. Ideal for shimming, lining, painting and replacing timber decks. Two base sizes to fit between ties. Ratchet lowering for safety. Double socket permits use in close quarters.

ALSO: Push and pull jacks for piling.

Time-Saving TIE SPACER

Straightens, Spaces Ties. Pumps Rails. Easily applied and removed. Slides along top of rails.

RAIL EXPANDERS for the Maintenance and Signal Departments



Permits *one* man to replace a rail pounding crew! For lining crossings and switches, pushing or pulling continuous rail, controlling expansion or contraction with no interruption of service. With lever socket locked down, nothing protrudes above rail head.

Pole Pulling and Straightening Jacks for the Signal Department

Two sizes, 5 and 15 tons for pulling or straightening all sizes of poles. Pivots on base, when desired, to any angle. Can also be used for guy wire tightening or for pulling underground cable. Model A1538—15-ton capacity—available with aluminum housing which reduces weight 35 pounds.

ALSO: Cable Reel Jacks for drums 30- to 96-in. diameter.

WORLD'S LARGEST MECHANICAL AND MFGRS. OF INDUSTRIAL HYDRAULIC JACKS

SIMPLEX JACKS

RE-MO-TOOL UTIL-A-TOOL JOHNY ROL-TOS

Write for Details in Bulletin RR 55

TEMPLETON, KENLY & CO. • 2543 Gardner Road, Broadview, Illinois

What's the Answer (Cont'd)

necessary repairs and good judgment on his part will not place three men on a job, where only one is required.

In establishing a program the foreman must first acquaint himself with the various practices on his railroad. Then having also acquainted himself with the various chores to be handled, he must give each and every job careful study to determine the amount of labor required and a suitable time to do the work. With this knowledge available he will then be in a position to draw up a schedule and keep it in front of him at all times.

Suppose that the foreman has determined that various regular chores on his section will require a total of 40 hr. weekly; and also suppose that his allotment is 4 laborers; then if he programs one man on these miscellaneous duties he will still have 3 laborers or 120 man-hours available to devote to general track work.

Program, Insofar as Possible

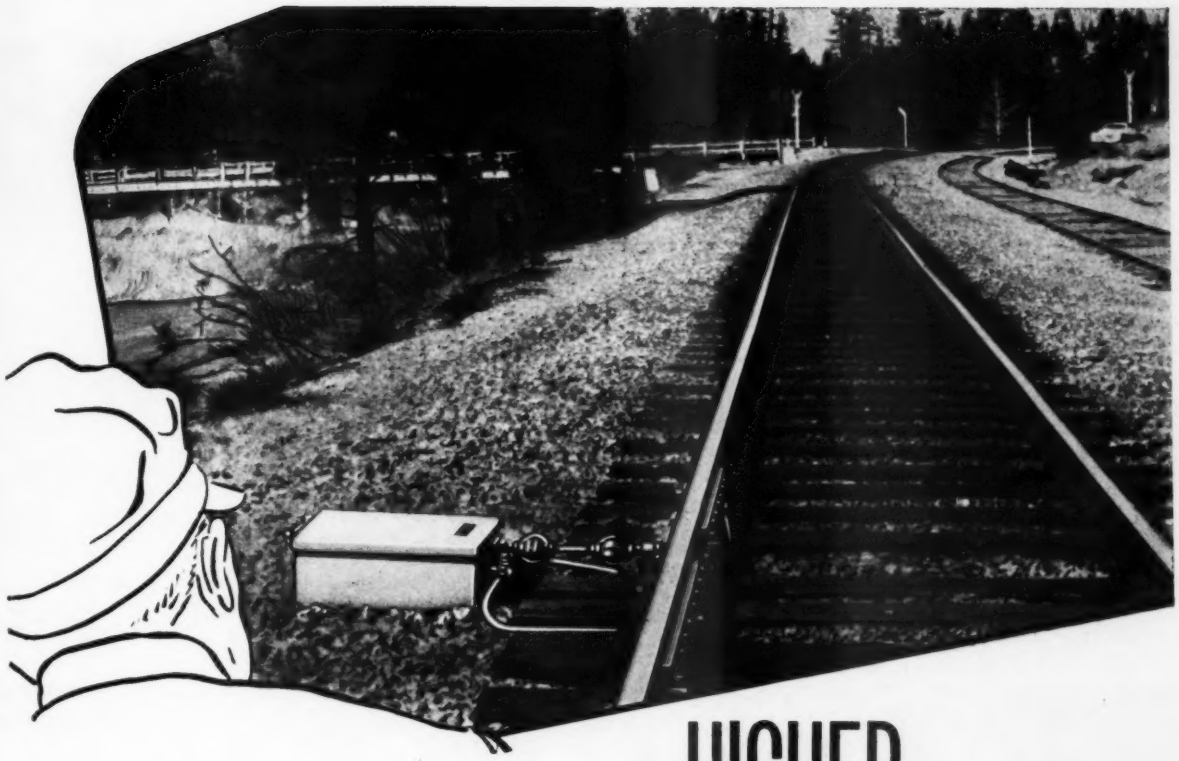
By B. H. Crosland

Assistant Chief Engineer, St. Louis-San Francisco, Springfield, Mo.

Under our latest reorganization program we have only a few section gangs left. These are assigned either to a small minor terminal or an outlying branch line that could not justify a regular crew of the district-gang type.

It is my opinion, and I believe all maintenance men will agree, that all maintenance work possible should be programmed in order to obtain the full benefit of equipment, material and organized work. It is recognized that there is some quick spot-maintenance work which must be done in an "on-the-spot" basis. This is work that is usually done without making proper preparation to determine its economical results.

Experience we have had with programming track work has indicated definitely that regardless of the size of the gang, the length of the territory or the type of work, it is possible and practical to program the larger percentage of the work to be done. In other words, insofar as possible, anticipate failures rather than repair them after they occur. In that direction lies real maintenance.

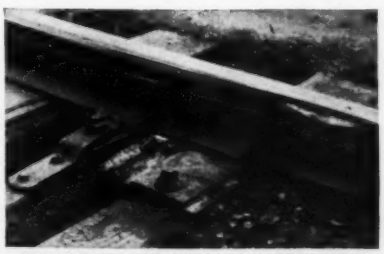


TAKE CURVES AT TODAY'S HIGHER SPEEDS with GREATER SAFETY

install MECO rail and flange lubricators

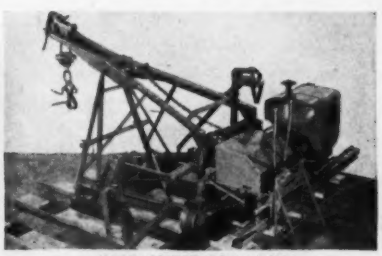
MECO Rail and Flange Lubricators reduce friction and wear on rails and wheels, by applying grease between the wheel flanges and the rail head.

This not only increases safety, but also doubles to quadruples curve rail and locomotive wheel flange life.



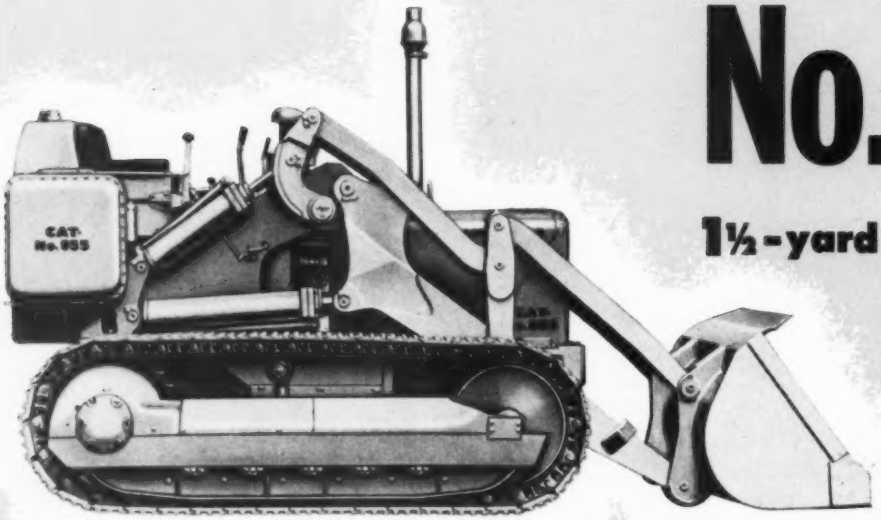
MACK REVERSIBLE SWITCH POINT PROTECTOR
Prolongs the life of switch points about 4 times; then is reversed and again extends the switch point life for another similar period.

TYLIFE
Improves track structure . . . Increases tie life. Provides greater holding power in crossties and bridge timbers; reconditions old spike-worn holes; reduces labor of re-gauging and re-spiking.



MECO POWER RAIL LAYER
Reduces labor cost to a minimum in laying Standard Rails, Long Rails or Continuous Welded Rail. Operates efficiently with small gang.

★ Maintenance Equipment Company ★
RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS

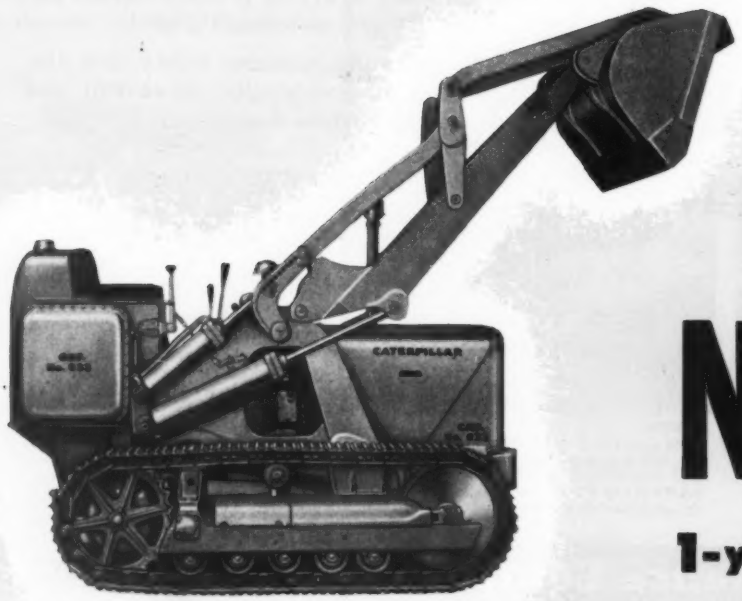


No. 955

1½-yard capacity

Caterpillar announces

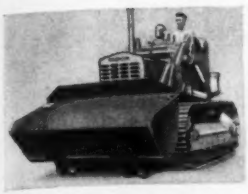
2 NEW



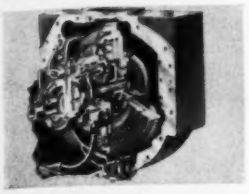
No. 933

1-yard capacity

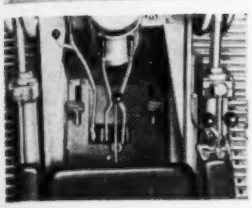
"BIG-PRODUCTION" FEATURES OF THE NEW NO. 955 AND NO. 933



40-DEGREE BUCKET TIP-BACK AT GROUND LEVEL. Large tip-back at low bucket height results in larger loads every pass—bigger production per day!



NEW OIL-TYPE CLUTCH. Stands up under continuous, repeated use. Cuts maintenance costs and time two ways: (1) Clutch adjustment, while easy, is seldom required. (2) Plate replacement is often unnecessary even at engine overhaul. Also helps step up production with easier shifting for operator.



CONVENIENTLY LOCATED LIFT AND DUMP LEVERS. All controls are within easy reach—bucket controls are a one-hand operation!

"DESIGNED-IN" COMFORT. Operator sits high in a comfortable seat, with excellent visibility of all bucket conditions.

PERFECT BALANCE. Weight distribution, engine horsepower and bucket capacity are balanced so that the full length of the track stays on the ground with a heaped load in the bucket.

NEW 3-GROUSER TRACK SHOES. Tested and proved on tough jobs, they deliver better traction—longer life.

OPTIONAL STARTING. Your choice of 6-volt electric starting for starting engine or 24-volt direct electric starting—from the seat, either way.

VERSATILE ATTACHMENTS. Your job range is increased by a variety of buckets and other useful attachments.

BRIEF SPECIFICATIONS	No. 955	No. 933
Flywheel HP at sea level	70	50
Bucket capacity, cu. yd.	1½	1
Bucket tip-back at ground level, degrees	40	40
Bucket tip-back at max. lift, degrees	47½	48
Dumping height (center of hinge pin to ground)	128"	118½"
Weight (approx.) lb.	21,480	15,500

W TRAXCAVATORS

MODERN HYDRAULIC SYSTEM. Full-flow hydraulic system filter protects moving parts against abrasive particles in fluid. Filter handily located for easy replacement of element.

Hydraulically balanced vane-type pump insures delivery of full volume and pressure of oil for thousands of hours. Operating valves in tank provide maximum protection against damage and dirt. Closed hydraulic system—no vents or breathers—prevents entrance of dirt.

HIGH REACH. Plus strong box section arms for rugged service. Box-type cross brace prevents twisting or bending.

PLENTY OF POWER. Power is ample to "bury" the bucket and provide fast lifting action and positive dumping under all load conditions.

BALANCED UNITS for BIGGER PROFIT!

Designed from the ground up as excavating and loading machines, these two new CAT*-built Traxcavators* are balanced for bigger production at lower cost. Built and backed by *one* manufacturer, they give you all the advantages of single manufacturing responsibility. With practical, advance-design features, they're engineered to *outproduce* ordinary tractor-shovels of the same capacity. You'll find these units the handiest tools in your line-up. Get the money-making picture from your Caterpillar Dealer—ask for a demonstration!

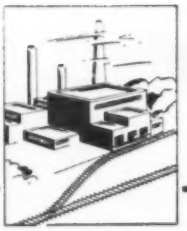
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

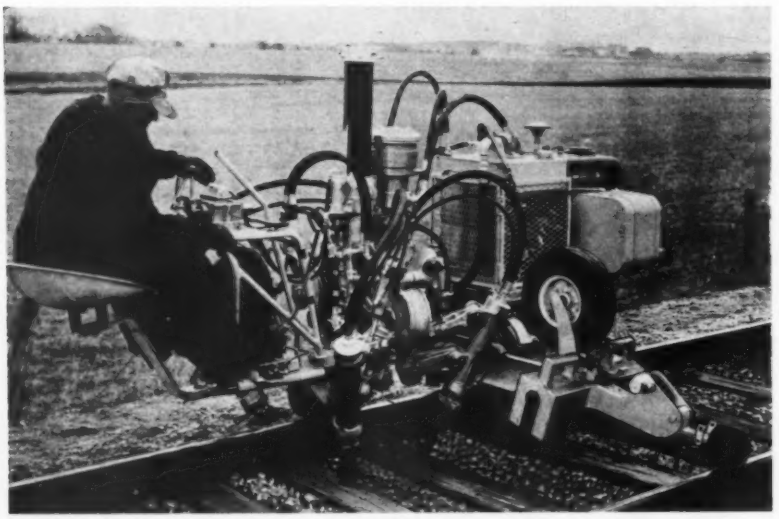
NEW BIG-PRODUCTION TRAXCAVATORS

ANOTHER EXAMPLE OF CATERPILLAR LEADERSHIP IN ACTION



PRODUCTS OF MANUFACTURERS . . .

. . . new, improved equipment, materials, devices



HYDRAULIC TAMPER

THE HYDRA QUAD tamper, a one-man operated, completely hydraulic, four-unit tie tamper developed by Racine Hydraulics & Machinery, Inc., Racine, Wis., has now been placed in production. The production model incorporates many improvements over the pilot model first described in the September 1953 issue of *Railway Track & Structures*. Important among these is the fact that the unit is now self-propelled and has a seat for the operator.

In this tamper, one central low-pressure (500 psi) hydraulic pumping unit, with direct-engine drive, delivers approximately 1100 blows per minute to each of four tamping guns. This power is supplied from an hydraulic accumulator and directed to each of the tamping-gun hammers through a specially designed valve. The four tamping guns tilt automatically, which is said to carry ballast, fed by the vibrating action, to the proper tip under each tie. Each tamping gun works independently of the others which is said to insure full compaction of the ballast at all points. The main head can be swiveled by the operator to accommodate crooked ties.

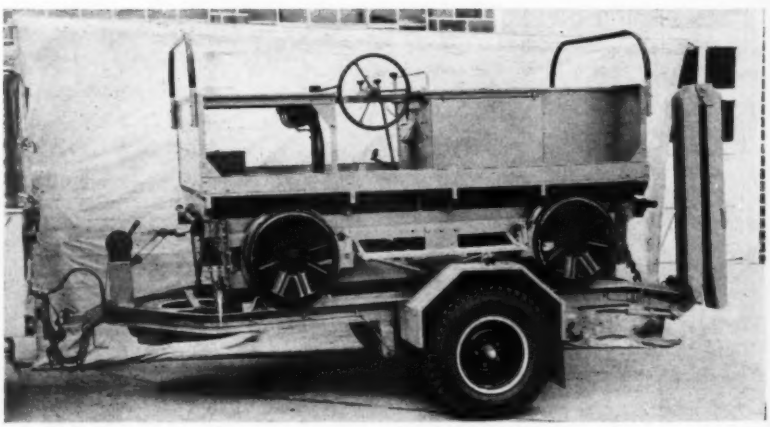
Power is supplied from a 15-hp, four-cycle, air-cooled Wisconsin engine.

The entire tamping mechanism, including the power unit, is rubber mounted. The fluid motor provides means for propelling the machine along the rail through a mechanical-positioning clutch arrangement.

Two outboard rubber-tired wheels and a swivel-type drop-down wheel on an outrigger are said to provide a quick and easy means for removing the machine from the track. A hand-operated hydraulic cylinder is provided as an aid in raising and pivoting the machine and letting down the set-off wheels in operating position. A power winch operated by a fluid motor assists small gangs in returning the machine to the track. No prepared set-off location is required.

HIGHWAY CARRIER

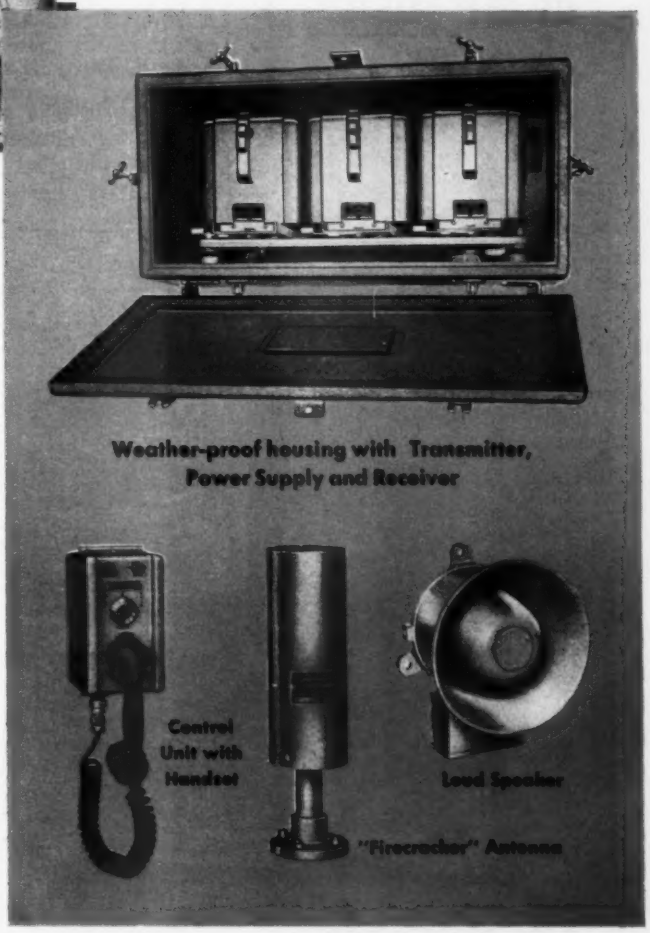
A MOTOR-CAR CARRIER, which operates as a highway trailer, for transporting gang-type motor cars has been introduced by Fairmont Railway Motors, Inc., Fairmont, Minn. The motor car is loaded on the trailer with the aid of folding ramps and a small hand-operated winch, which are integral parts of the trailer. When loading is complete the car is fastened down by three chains each equipped with self-locking toggle clamps. The new trailer, designated as Model TH2 Series A, has a load capacity of 2,600 lb and weighs 1,300 lb. The trailer body is a welded-steel frame mounted on 7.00 by 15 tires and is provided with a heavy-duty hitch with safety chains. Equipment includes dual stop and tail lights, and clearance lights on the fenders. The wiring for the lights extends all the way to the hitch. Optional extras include electric brakes and directional turn signals.



Federal

IS THE TRAIN RADIO SYSTEM THAT REALLY "SIDETRACKS" OBSOLESCENCE!

Provides maximum economy through LONG life expectance that's backed by LASTING design efficiency!


Weather-proof housing with Transmitter, Power Supply and Receiver
Control Unit with Handset
Loud Speaker
"Firecracker" Antenna

Your train radio dollars . . .

buy *more* "mileage" in Federal than in any other system. That's because Federal equipment is produced under a *rigid policy of avoiding unnecessary obsolescence!*

The newest Federal adjacent channel equipment, for example, can be plugged into and used in the *oldest* racks . . . with only minor wiring changes in the racks. No other supplier can offer this important economy.

Present receivers can be converted to split channel operation *in the field* . . . at a cost of only a few dollars for parts.

In ruggedness alone, Federal is without equal. Today, life expectance is better than 10 years. Even equipment that has been *flood-soaked* has been cleaned and dried and restored to service at small cost!

Get the facts today about the train radio system of proved-in performance and economy . . . Federal . . . the *pioneer* system that's standard equipment on leading railroads here and abroad.

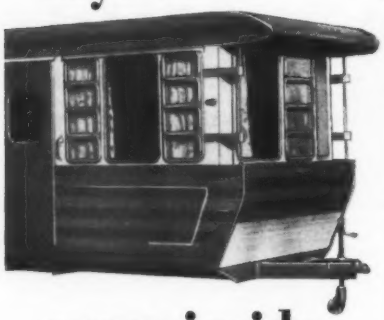
For complete information write to Federal's Railroad Industry Sales Organization, Dept. P-186

Federal

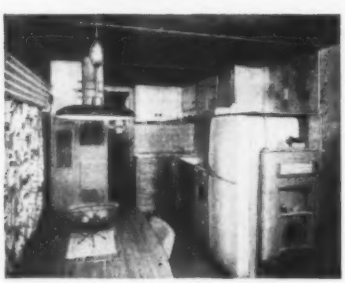
A DIVISION OF IT&T

Federal Telephone and Radio Company
A Division of INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION
100 KINGSLAND ROAD • CLIFTON, NEW JERSEY
In Canada: Standard Telephones and Cables Mfg. Co. (Canada) Ltd., Montreal, P. Q.
Export Distributors: International Standard Electric Corp., 67 Broad St., New York

the outside
"says"...



come inside



the beautiful new

Travelmaster

Greetings! That's what the warm, friendly interiors of these beautiful new Travelmasters "say." Be sure to inspect one soon. Four sizes: 42′, 38′, 34′ in one and two bedrooms. 30′ in one bedroom.

Write for new literature today

Travelmaster
COACH CORP.
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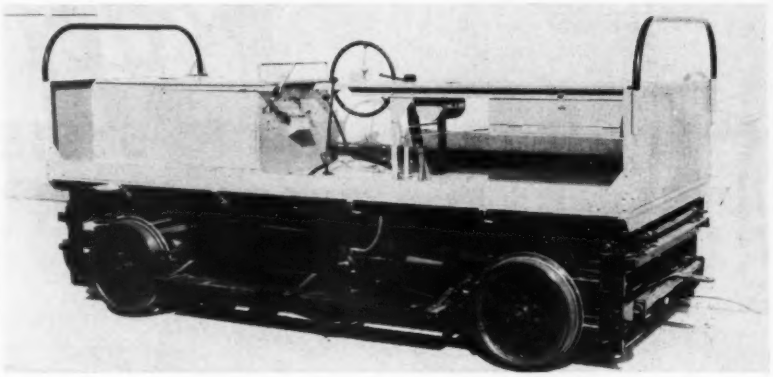


GANG CARS

IMPROVED HEAVY-DUTY gang cars to be designated as Model A6 Series F, with a capacity of 10 men, and Model A8 Series B, with a capacity of 14 men, have been announced by Fairmont Railway Motors, Inc., Fairmont, Minn. Both of these cars will now be equipped with overhead-valve engines. The A6 model will have a Ford 6-cylinder, 115-hp engine as standard, but can be supplied with a V-8 engine if desired. Model A8 will be driven by a Ford V-8, 130-hp engine. Both models are equipped with a hand wheel and cable for controlling the brake, and full-width tool-tray end panels as high as the seats.

TRACTOR-SHOVEL

A NEW FOUR-WHEEL-DRIVE tractor-shovel known as Model HO Payloader, has been announced by the Frank G. Hough Company, Libertyville, Ill., to supplement the recently announced HU and HH models, of 1 and 1½-cu yd capacity, respectively. This new model is said to include all of the features of earlier models, including 40-deg bucket "break-out" at ground level and the "pry-out" action which transfers opposing load forces directly to the ground instead of through the wheels and hydraulic system of the machine.

In addition to the features included in the other models the new HO model includes a newly developed power-shift transmission. It is reported that the clutch pedal has been eliminated and all shifts through all speed ranges in both the forward and reverse direction can be made without coming to a stop or slowing down.

ELECTRIC IMPACT TOOL

DESIGNED for applications where maximum power and speed are not required is the new size 4U-SD Electric Impactool, announced recently by Ingersoll-Rand, New York.

The new tool is designated as a standard duty model of the heavy-duty 5U Impactool, and includes the same impact mechanisms and all other construction features provided in the 5U. It is both smaller and lighter in weight than the 5U.

1 Early morning start. Railroad Gradall, with oversize track-climbing tires, easily climbs rails to move up the line to first job site.

2 First job—cleaning drainage ditches, working right from roadbed. Gradall's accurate, fast digging action slashes costs on this type of work.

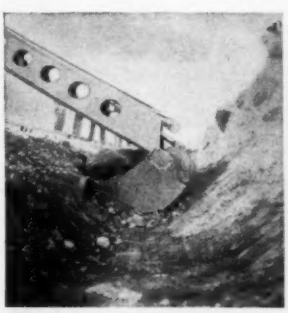
3 Complete control of Gradall's telescoping, arm-action boom and the wrist-like action of the bucket enables operator to grasp and remove even large boulders.

4 No traffic interruptions with a Gradall! When the way must be cleared, the Gradall simply straddles or moves off track while train passes.

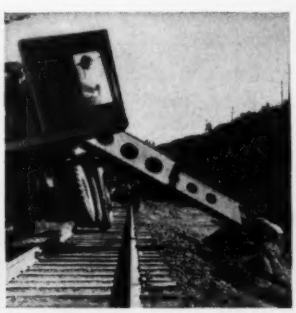
Let's spend

A DAY WITH A RAILROAD GRADALL®

These photos were taken on an actual full-day Gradall demonstration for officials of a leading railroad. They show a few of the many maintenance and construction jobs on which Gradalls have proved real cost cutters for railroads.



5 Quickly back on the job! Gradall cleans culvert openings, working in close around culverts, without damaging pipe, maintaining proper grade.



6 Gradall shows its power. Should a Gradall encounter soft spots, pushing with its powerful telescoping boom will raise carrier wheels to free machine.

7 Off to the next job—right down the roadbed, with ample clearance for passing trains. Where tracks are closer together, Gradall can straddle track.

8 Gradall makes fast work of clearing a rock slide. A special rock bucket, attached in less than 5 minutes, easily handles large rocks.

9 Clearing the slide, the Gradall swings around a full 180°, and "reaches out" across roadbed, to dump rock and build up shoulder on far side.

10 Aligning track on curve, Gradall exerts its powerful hydraulic pressure—pushing or pulling—properly positioning track without moving ballast.

11 Laying rails, Gradall is used as a crane to quickly and accurately position rails. This is just another of the many "bonus" railroad jobs handled by Gradalls.

12 A full day's work done, Gradall heads for home. Less than 12' clearance permits a Gradall to easily drive through or even work inside tunnels.

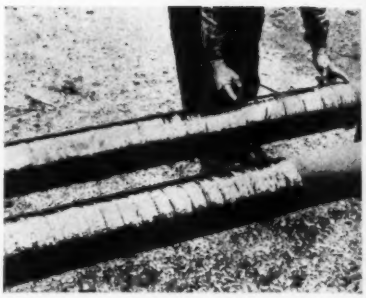
For a Gradall field demonstration on your work, write:
GRADALL DIVISION, WARNER & SWASEY CO., CLEVELAND 3, OHIO

Gradall
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880
● Reg. U. S. Pat. Off.

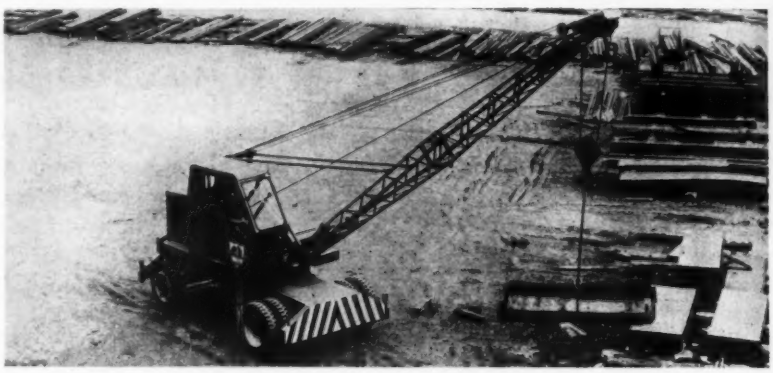
YOU CAN DO IT BETTER, FASTER, FOR LESS WITH A GRADALL

COAL-TAR TAPE

A SINGLE-WRAP coal-tar tape for use on pipe, pipe joints, fittings and couplings has been announced by the Tapecoat Company, Edison, Ill. Known as "Tapecoat-X," it is claimed that this new product offers double-wrap protection from a single-wrap application. The tape can be applied with only ½ in overlap in contrast with the regular method of overlapping slightly more than half of the width of the



tape to secure effective protection. Tapecoat-X is available in rolls of 2-in, 3-in, 4-in and 6-in widths.



SHOVEL-CRANE

A NEW SELF-PROPELLED ¾-cu yd 6-ton shovel-crane designed for material handling has been announced by the Schield Bantam Company, Waverly, Iowa.

The new model is known as Bantam CR-35.

This new crane has a turning radius of 19½ ft which is said to give it extreme maneuverability for working in tight quarters with heavy loads.

It is equipped with two-speed independent travel which allows the operator to work the upper-deck machinery and travel at the same time. The steering mechanism and brakes are hydraulically controlled.

The machine has a wheel base of 112 in, overall length of 173¼ in, overall width of 96 in, and an overall height of 125 in. Ground clearance is 15 in. Model CR-35 is complete with counterweight, outriggers and standard 25-ft crane attachment.

It is reported that interchangeable attachments, such as clamshell, dragline, shovel, trench hoe, magnet, grapple, pile driver and backfiller, can be applied quickly providing versatility for all types of jobs.

Here's how we

SAVE ON RAILS

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THE MONTH'S NEWS...

. . . among railway men—the associations—the suppliers

General

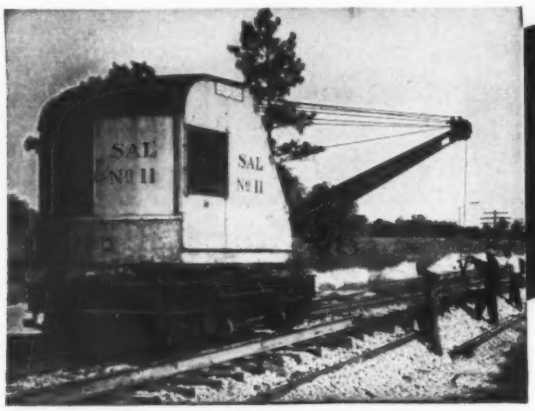
L. R. Jabinson, division engineer on the Peoria & Eastern, a New York Central subsidiary, has been named general manager and division engineer, with headquarters at Indianapolis, Ind. Mr. Jabinson succeeds **K. F. Emmanuel,** who has retired after 39 years of service.

Mr. Jabinson began his railroad career in January 1919 as an assistant engineer in the NYC's maintenance of way department at Mattoon, Ill. He later served in engineering posts in Ohio, Illinois and Indiana before joining the Peoria & Eastern in February 1943 as assistant engineer. He was promoted to assistant division engineer in 1948, and became division engineer in January 1951.

R. P. Taylor, Jr., track supervisor on the Southern at Charleston, S. C., has been advanced to assistant trainmaster at Asheville, N. C.

W. H. MacIlroy, construction engineer on the recently completed Canadian National line from Terrace, B. C., to Kitimat, has been made superintendent of the Smithers division, Prince Ruppert, B. C.

J. H. Hertog, trainmaster-roadmaster on the Northern Pacific at Mandan, N.D., has been appointed trainmaster-roadmaster at Jamestown, N.D., and **H. W. Johnstone,** division roadmaster at Minneapolis, Minn., has been appointed trainmaster-roadmaster at Mandan replacing Mr. Hertog. **E. M. Overlie,** trainmaster-roadmaster at Bemidji, Minn., has been appointed trainmaster at Tacoma, Wash., and **C. E. Johnson,** roadmaster on the Red River branch, becomes trainmaster-roadmaster at Bemidji, replacing Mr. Overlie.



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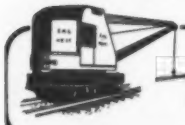
Only BURRO CRANES HAVE:

- Fast travel speeds—up to 22 M.P.H.
- Draw Bar Pull of 7500 lbs. (often eliminates need for work train or locomotive).
- Elevated Boom Heels for working over high sided gondolas.
- Short tail swing—will not foul adjoining track.
- Low overall height—Burro can be loaded and worked on a standard flat car.

You are cordially invited to drop in at the Cullen-Friestedt Hospitality Rooms—Conrad Hilton Hotel, during the conventions.

Write for Bulletins on Burro Cranes



CULLEN-FRIESTEDT CO.

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Engineering

D. T. Faries, assistant engineer on the Bessemer & Lake Erie, has been appointed engineer of track at Greenville, Pa. The position of assistant engineer formerly held by Mr. Faries has been abolished. **L. D. Shelky,** office assistant to chief engineer, has been promoted to assistant engineer, succeeding **G. G. Martin,** who has retired. **V. H. Fisher,** chief clerk, has been named office assistant to chief engineer, replacing Mr. Shelky.

Mr. Faries was born at Trenton, N. J., September 29, 1912. He attended the Virginia Military Institute where he received a BS degree in civil engineering in 1935, and began his railroad service with the Wabash as a draftsman at St. Louis in June 1935. In April 1936 he was promoted to third assistant engineer at Montpelier, Ohio, and in May 1937 was appointed assistant engineer on the Ann Arbor at Owosso, Mich. He returned to the Wabash in March 1938 as second assistant engineer at Montpelier, becoming grade separation engineer at Chicago in April 1939. He was appointed track supervisor on the Ann Arbor at Owosso in October 1939, remaining there until he joined the Bessemer & Lake Erie as assistant track supervisor at Greenville, Pa., in December 1941. He was promoted to track supervisor at Greenville in October 1943, and became assistant engineer there in November 1949.

D. T. Faries

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Chipman Chemical Company weed killers, brush killers and application service are backed by over 40 years of experience in serving railroads. An extensive line of weed, grass and brush killing chemicals is available to meet varying conditions. Included are the following:

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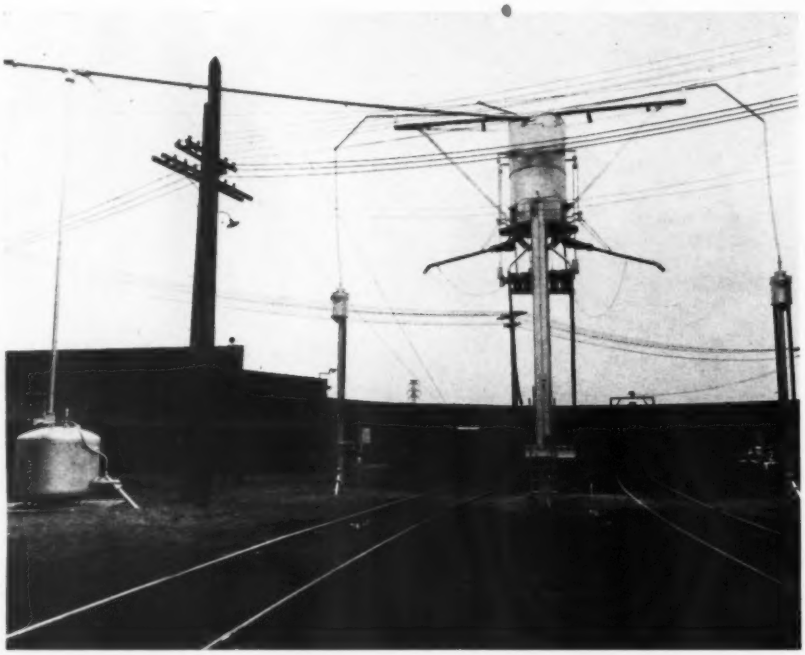

SNOWCO TYPE A SAND POTS installed at Diesel sanding station on the Chicago, St. Paul, Minneapolis & Omaha. Ground-level storage tank at left.

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Type A Sand Pots

Here's an easy solution to a common sanding problem.

Problem: How to convert a sanding station with elevated storage tank for delivering sand to the pockets on **both** sides of locomotives—without raising the storage tank.

Solution: Install Snowco Type A Sand Pots. Placed at a convenient height on columns, these pots deliver sand by gravity to side pockets while being supplied by air pressure from ground-level storage tanks.

Economical to install. Eliminate need for overhead delivery pipes from existing elevated storage tank. Patent Applied For

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Construction Company

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PROTEK-COAT— the ideal preservation for bridge ties and timbers against weather deterioration, and also against surface fires on horizontal surfaces.

PROTEK-COAT (S)— recommended for Signal Department instrument boxes, switch machine boxes, insulated joints, etc. Insulates against varying weather conditions. Protects against brine drippings and other corrosive elements.

FIRE SEAL #412— for bridge ties and vertical and horizontal timbers. Completely fireproof during application and after application.

PROTEK-TIE— protects cross and switch ties against weather deterioration.

NOX-RUST TIE SEAL— retards mechanical wear between tie plate and tie. Prevents rust on the bottom of the tie plate; water-proofs, and toughens the surface of the tie.

NOX-RUST 506— for protection of super-structures of steel bridges and buildings. Highly resistant to sulphurous fumes, weather, acids and alkalies and also to spattering brine from refrigerator cars, salt air and other elements which are corrosive to steel. Nox-Rust 506 is a one-coat job; you need no primer. Economical to use.

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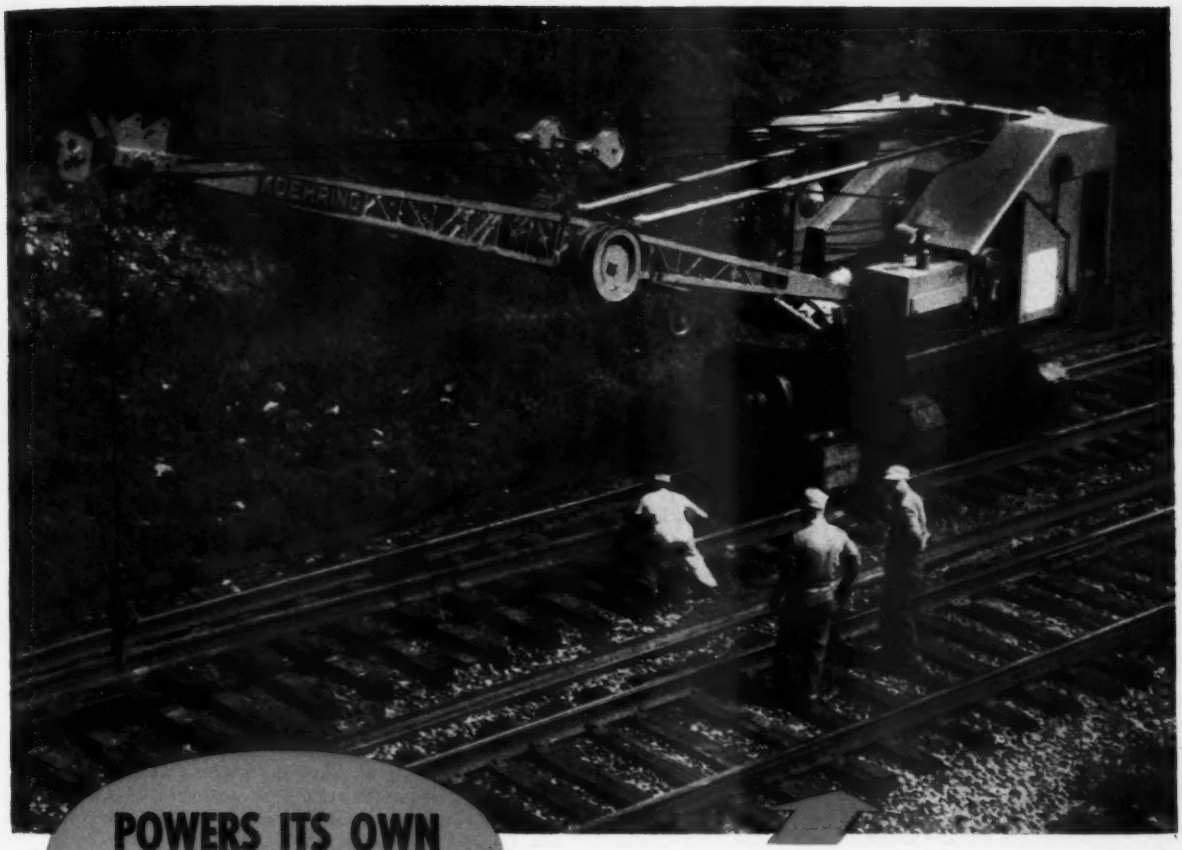

POWERS ITS OWN RAIL CAR . . . gets on or off-track in 10 minutes

To move from one work section to the next, Koehring 205 RailAid takes to the rails, travels on track at speeds up to 20 m.p.h. It's self-propelled, powers its own rail car . . . does 2 to 3 times the work of ordinary excavators or cranes that have to crawl or be hauled from job to job. Because all travel is by rail, crawler life is considerably increased. Yet, you have complete flexibility for working on or off-track.

Koehring 205 loads or unloads itself on ramp-equipped car in 10 minutes. Crane or excavator sets car on or off-track . . . clears the right-of-way for through traffic. You can send it anywhere along the line at a moment's notice to do any digging, lifting or material-handling. It works on or off the propulsion car with all standard attachments . . . cleans ditches, widens embankments, stockpiles coal or ballast, loads and unloads cars, repairs trestles, lays rails, does pile-driving.

You get ½-yard dipper capacity as a shovel or hoe. As a crane, it safely lifts 6.9 tons from car, 8.9 tons on ground . . . converts to clamshell, dragline. For more facts, write: *Koehring Company, Milwaukee 16, Wisconsin.*

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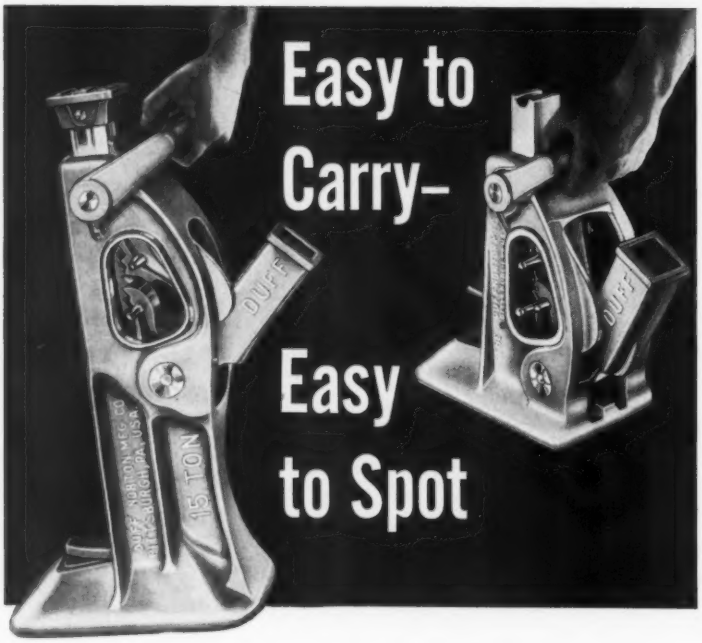

That's the story on Duff-Norton lightweight aluminum track jacks.

No. 517BA single acting surfacing jack (right) can raise 15 tons, 5 inches, and is twenty-five per cent lighter than a similar jack with a malleable housing. No. 117A single acting track jack (left) can move 15 tons, 13 inches and is thirty-three per cent lighter than its counterpart with a malleable housing.

Safe, rugged, dependable Duff-Norton aluminum track jacks soon pay for their slight additional cost by increased productivity . . . crews can keep pace with fast, modern maintenance equipment.

Get the complete specifications on these and other Duff-Norton track jacks. Write the world's oldest and largest manufacturer of lifting jacks for Track Jack Bulletin AD18-F, Duff-Norton Company, P. O. Box 1889, Pittsburgh 30, Pa. Canadian plant—Toronto 6, Ontario.

DUFF-NORTON

Jacks

"Giving Industry A Lift Since 1883"

Railway Personnel (Cont'd)

W. E. Chapman, engineer maintenance of way on the Central of Georgia, has been appointed to the newly created position of superintendent of maintenance of track and bridges and buildings. **W. S. Ray,** engineer of bridges, has been named to the newly created position of general superintendent of bridges and buildings.

W. E. Chapman

Mr. Chapman, a native of Ozark, Ala., graduated in civil engineering from Alabama Polytechnic Institute in 1924. After serving with the Alabama State Highway Department and as accounting engineer, he joined the C of Ga in the engineering department at Savannah in February in 1925. He subsequently served as assistant and acting supervisor on the Savannah division for two years until being promoted to supervisor on the Columbus division in 1936. He was promoted to division engineer at Columbus in March 1942 and was advanced to engineer maintenance of way in January 1953.

Mr. Ray has been with the C of Ga since January 1925, beginning as a bridge and building inspector. He is a native of Blackville, S. C., and a civil engineer graduate of Clemson College. In 1928 he was promoted to assistant engineer, named architect in 1941, and was made assistant engineer of bridges and buildings in 1947, and engineer of bridges in 1950.

W. S. Ray

C. R. Wright, whose retirement as assistant chief engineer on the Nickel Plate was announced recently (*RT&S*, Aug., p.57), was born at Ravenna, Ohio,

But there is a difference In railroad supply salesmen

That difference? The specialized knowledge and experience that mark your Fairbanks-Morse Railroad Specialist as an expert.

He is part of the largest staff of application engineers serving the railroad industry—exclusively.

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In addition to his own significant contribution, he is backed by:

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—The knowledge gained in manufacturing a complete line of electric motors since 1905.

—The world's largest diesel design staff . . . creators of the engine in the most powerful locomotive on the rails—the F-M Train Master.

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GORMAN-RUPP PUMPS ARE BEST

Because they're

- THE SIMPLEST!
- QUICKEST PRIMING!
- FASTEST PUMPING!
- NEVER FAILING!

The greater capacity of Gorman-Rupp pumps when working against high heads is most important.

They have demonstrated their superiority on all kinds of tough pumping jobs the country over. They have no equal in the self-priming centrifugal field and **will pump more water per gallon of fuel** than any other comparable pump. Being practically trouble free they require a minimum of maintenance.

Ask about the new Gorman-Rupp Diaphragm Pump with 400% more priming and diaphragm life increased 10 times compared with other diaphragms. Ask for Bulletin 4 DR-11.

Gorman-Rupp pumps are available in all sizes from 1½", 5850 g.p.h. to 12", 240,000 g.p.h. Ask for Bulletin No. 8-CP-11.

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Trailer-mounted
ONAN "CW" Electric Plant
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For floodlighting, operating electric tools, emergency standby use.

Goes Anywhere!

Here's real mobility in high-capacity electric plants. You can tow a trailer-mounted Onan "CW" as fast as a car will travel . . . anywhere a tractor can go. Fully-protected by heavy-gauge steel housing; stays on the job in any weather.

Onan "CW" Electric Plants are unusually compact, quiet-running and economical to operate; weigh only half as much as water-cooled plants of the same capacity. Powered by Onan two-cylinder, suction-air-cooled gasoline engines built with massive, long-wearing parts for continuous, heavy-duty service.

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WIDE RANGE OF ACCESSORIES

You can equip your "CW" Electric Plant for any type of portable service. Accessories include skid, battery rack, 9-gallon fuel tank, weather-proof housing, two-wheel trailer, or 4-wheel rubber-tired dolly. *Put one of these portable, high-capacity units on your job now!*

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D. W. ONAN & SONS, INC.
3413 Univ. Ave. S. E., Minneapolis 14, Minn.

Railway Personnel (Cont'd)

June 10, 1885. After attending high school and two years of college, Mr. Wright began his railroad service with the Nickel Plate in 1906 as a draftsman at Cleveland. In 1910 he was promoted to chief draftsman at that same point, serving there until being named division engineer at Conneaut, Ohio, in 1919. He later served in this same capacity at Cleveland until 1925 when he was made district engineer at Indiana. From 1931 to 1940 he served as district engineer at Frankfort, Ind., becoming assistant chief engineer in September 1940.

A. B. Taylor, Jr., whose promotion to chief engineer on the Norfolk Southern at Norfolk, Va. was announced recently (*RT&S*, Aug., p. 57), was born at Norfolk, January 27, 1910. He graduated from the Virginia Military Institute, with a BS degree in civil engineering in 1933. Following graduation he worked as an engineering inspector, Department of Public Works, City of Norfolk, from 1934 to 1937. In 1937 he joined the

A. B. Taylor, Jr.

Hardaway Contracting Company at Columbus, Ga., serving there until being appointed assistant building inspector for the City of Norfolk in 1938. He began his railroad service with the Norfolk Southern in 1941 as a draftsman and worked in this capacity until his entrance into military service in 1942. He attained the rank of major in the Air Force, and returned to the Norfolk Southern as assistant engineer in 1946. He was promoted to construction engineer in 1953.

M. Block, engineer of bridges on the Illinois Central at Chicago, has been promoted to assistant to chief engineer, succeeding **J. E. Fanning,** who has retired after 50 years of service. **E. A. Johnson,** assistant engineer of bridges, replaces Mr. Block as engineer of bridges. **A. L. Leach,** assistant to engineer of bridges, has been promoted to assistant engineer of bridges to succeed Mr. Johnson.

L. C. Winkelhaus, who has retired as assistant architectural engineer on the Chicago & North Western at Chicago (RT&S, August, p. 60), was born at Clinton, Iowa, February 7, 1884. He began his railroad service with the C&NW in

(*Continued on page* 90)

Locomotive crane hefts 90-100 ton loads

—*with help of TIMKEN® bearings*

BUILT for erection service by Industrial Brownhoist Corp., Bay City, Mich., this diesel-electric locomotive crane has a 150 ft. boom, a 30 ft. jib and a 90-100 ton capacity. To help handle the loads with ease, Timken® bearings were used practically everywhere—on the trucks, sheaves, side frame shafts, clutches, hoisting drums and boom hoist drums.

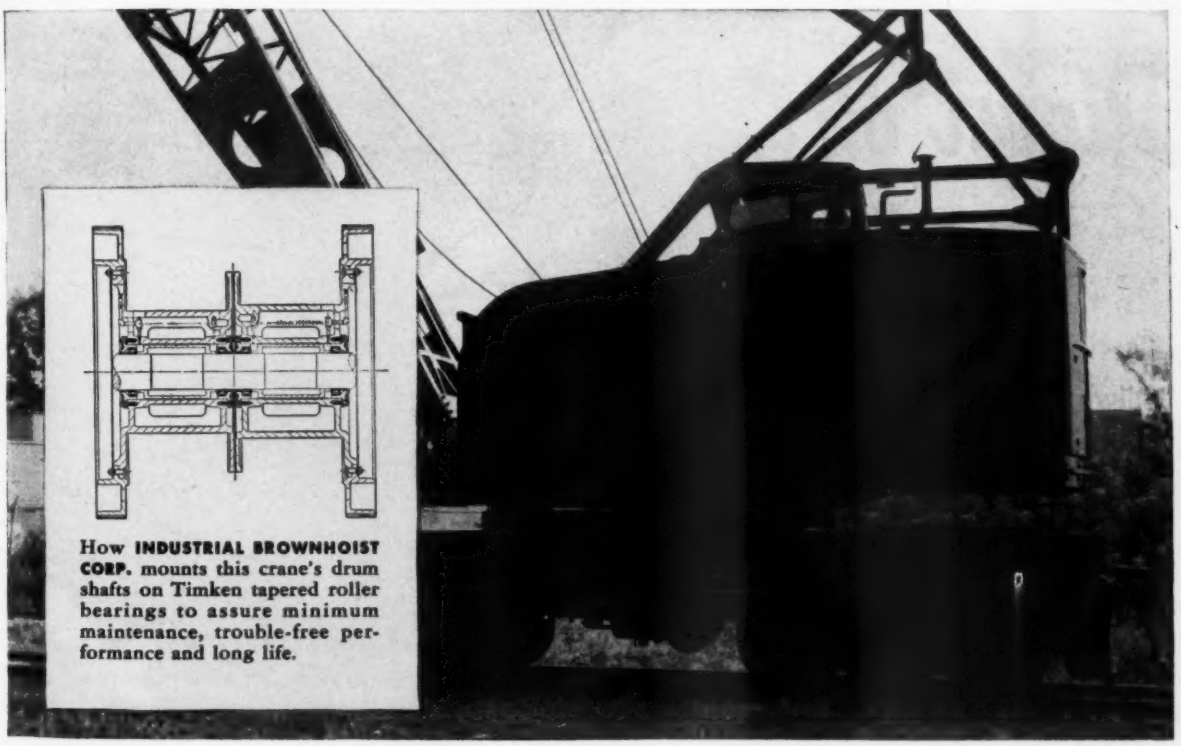
On the drum shaft, see diagram below, Timken bearings not only handle the radial load of the cable, but also take care of the thrust load caused by off-center cable winding. That's because the tapered construction of Timken bearings enables them to take radial loads, thrust loads, or *any* combination of the two.

Extra heavy loads or shock loads aren't a problem for two reasons: (1) full line contact between rollers and races gives Timken bearings load-carrying capacity to spare, and (2) rollers and races of Timken bearings are case-hardened to give them hard, wear-resistant surfaces over tough, shock-resistant cores.

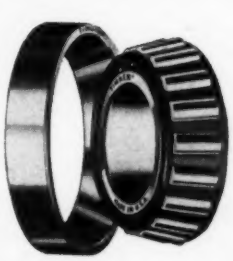
Wear is held down because Timken bearings practically eliminate friction. That's because they're designed to roll true and because we make them with microscopic accuracy to live up to their design. And you're doubly assured of Timken bearings' accuracy because we make our own steel.

To get these advantages in the equipment you build or buy, always look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **INDUSTRIAL BROWNHOIST CORP.** mounts this crane's drum shafts on Timken tapered roller bearings to assure minimum maintenance, trouble-free performance and long life.



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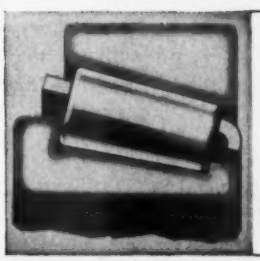
TAPERED ROLLER BEARINGS

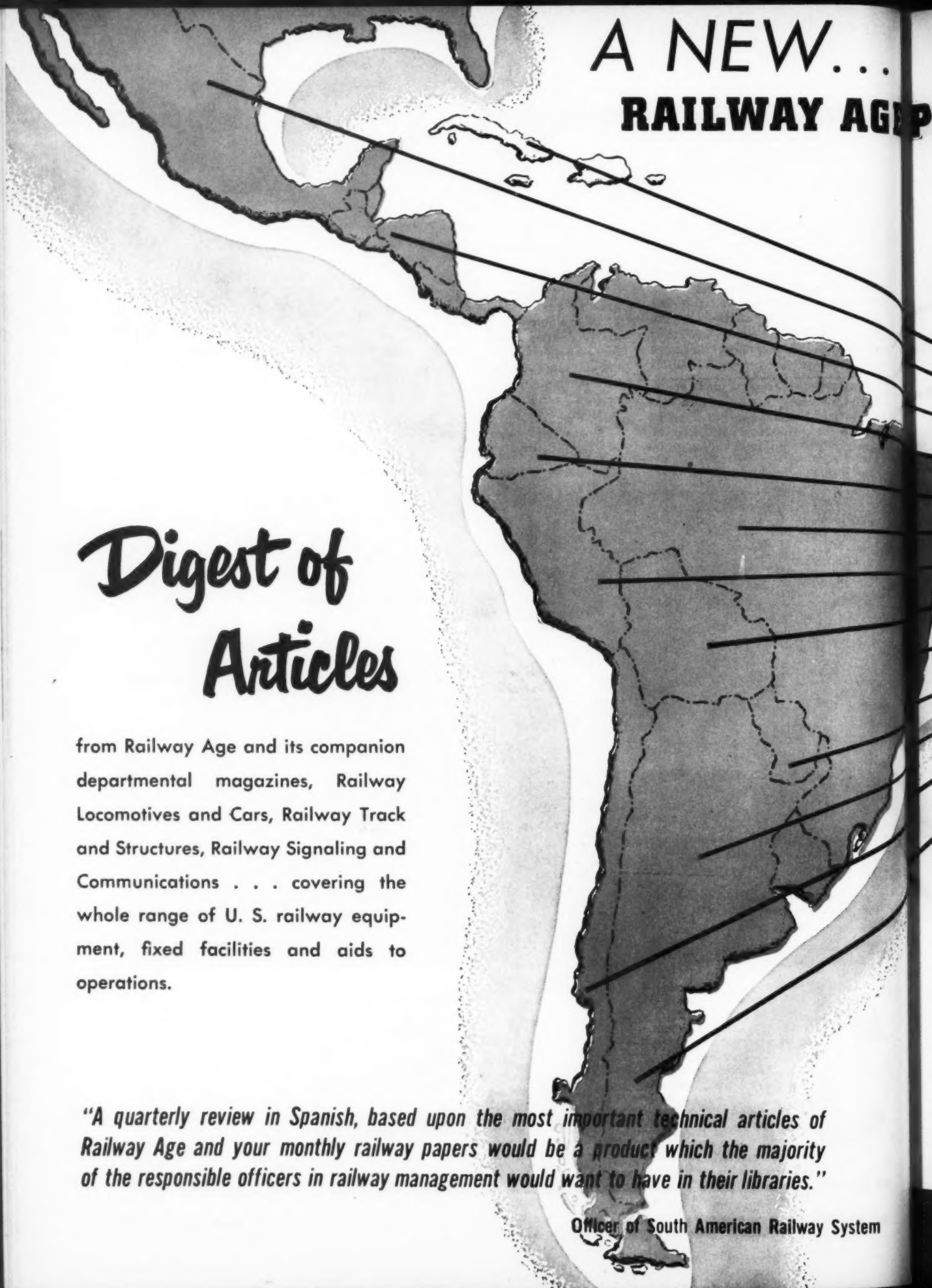


HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface over a tough, shock-resisting core. Result: longer bearing life.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. nickel-rich Timken alloy steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION →✳←



A NEW...

RAILWAY AGE

Digest of Articles

from Railway Age and its companion departmental magazines, Railway Locomotives and Cars, Railway Track and Structures, Railway Signaling and Communications . . . covering the whole range of U. S. railway equipment, fixed facilities and aids to operations.

"A quarterly review in Spanish, based upon the most important technical articles of Railway Age and your monthly railway papers would be a product which the majority of the responsible officers in railway management would want to have in their libraries."

Officer of South American Railway System

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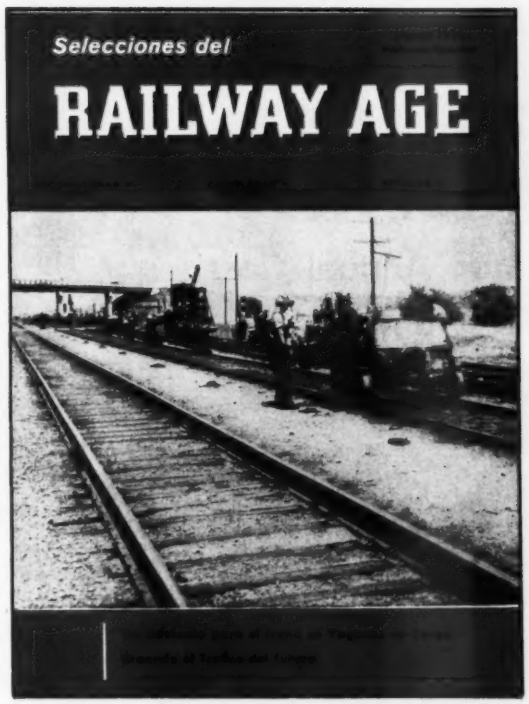

FIRST ISSUE

MARCH

1956

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Published Quarterly

Selecciones del Railway Age will provide a quarterly report in Spanish of North American railway developments in equipment and facilities for Latin American readers. All important news of locomotives, freight cars, passenger cars, shops, track and structures, signaling and communications, all kinds of devices and equipment for railway operations, accounting and record-keeping will be covered. Each of these many features will have a New Products Section to focus attention on the opportunities that U. S. products offer Latin American railways.

Emphasis editorially will be on how the U. S. railways are doing things and what they are adopting, buying, installing to improve their operations.

Selecciones del Railway Age will be a full-fledged 9" x 12" magazine with a comprehensive editorial content sectionalized and labeled throughout for easy use and reference. An important directory feature will be the listing of export sales offices of United States companies serving the Latin American market. From cover to cover it will be the type of magazine that will be kept, used and passed along for reference.

Selecciones del Railway Age will be distributed among the executive and technical officers of the railroads in every country in Latin America, including the Spanish speaking islands of the Caribbean. The pledge of cooperation from railways below the border insures comprehensive distribution throughout Latin America.

Selecciones del RAILWAY AGE

A SIMMONS-BOARDMAN PUBLICATION

Railway Personnel (Cont'd)

(*Continued from page* 86)

August 1901 as a stenographer to the superintendent B&B at Boone, Iowa. He later transferred to the division engineer's office at Chicago, leaving the railroad from 1903 to 1907 to attend Iowa State College where he received a degree in civil engineering. During the summer months while attending college, Mr. Winkelhaus worked in the North Western's engineering department. Following graduation from college he worked as a draftsman in the bridge department, later working in an engineering field party. He subsequently served as a camp draftsman, office engineer and levelman on various construction jobs until returning to the road's general offices in Chicago, where he served successively as a draftsman, estimator and assistant engineer in the offices of the auditor of capital expenditures. In 1920 he was appointed assistant engineer of building plans and specifications. The title of this position was later changed to architectural engineer. In 1953, Mr. Winkelhaus requested that he be relieved of the responsibilities of architectural engineer. He remained with the North Western as assistant architectural engineer until his recent retirement.

F. L. Rees, acting division engineer on the Santa Fe at Emporia, Kans., has been named division engineer at that same point succeeding **H. L. Miller,** who has retired after 48 years of service.

Born May 10, 1890, Mr. Miller graduated from public high school in Marceline, Mo., and received his engineering education at the University of Missouri. He began his railroad service as a call boy at Marceline in June 1907, serving subsequently as a yard clerk, chainman, rodman and transitman before being promoted to office engineer at Emporia in March 1827. He was promoted to division engineer at Arkansas City, Kans., June 28, 1942, and was transferred to Emporia in May 1948.

R. Laymon Mays, who has been named assistant chief engineer on the Nickel Plate at Cleveland (*RT&S*, Aug., p. 57), is a native of New Castle, Ky. He was graduated from the University of Kentucky in 1925 with a BS degree in civil engineering and in 1931 with a Civil

R. Laymon Mays

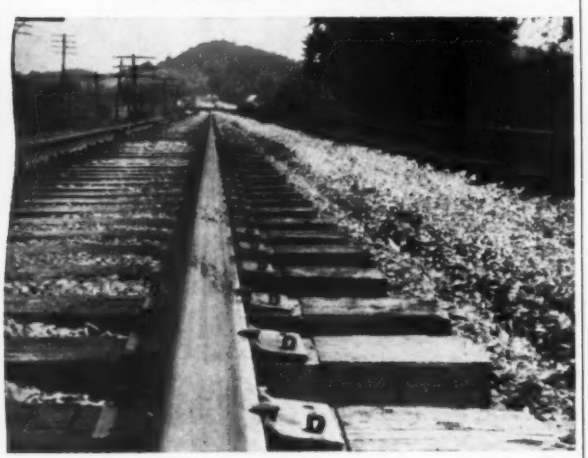
Engineering degree. He began his railroad service with the Nickel Plate in 1928 as a structural designer in the engineering department at Cleveland. He served successively as assistant engineer and assistant division engineer at Fort Wayne, Ind., until being appointed assistant superintendent of bridges and buildings at Frankfort, Ind. He later served as designing engineer at Cleveland, before being named division engineer at Frankfort in November 1948. He was made assistant to the chief engineer in 1953.

L. F. Racine, chief engineer of the Monon at Lafayette, Ind., has retired after 48 years of railroad service.

J. B. Davis, Jr., whose promotion to assistant chief engineer on the Norfolk Southern was announced recently (*RT&S*, Aug., p. 57), was born September 14, 1917, at Norfolk, Va. He began his railroad service with the Norfolk Southern in April 1937 as an office boy in the accounting department. He later served as a verifying clerk, distribution clerk and railroad retirement clerk until February 1943 when he entered military service. He returned to the railroad as a clerk in the accounting department in December 1945, and was appointed senior clerk in the M/W department in February 1946. He became chief clerk in January 1947, and was appointed valuation accountant in February 1949. He served successively as special assistant, engineering account-

USE TIE PLATE LOCK SPIKES

for Minimum Annual Cost of Ties in Track



• hold gage • prolong life of ties

• save maintenance expense

LOCK SPIKES hold tie plates firmly in place on cross-ties and bridge timbers. They are quickly and easily driven, or removed, with standard track tools. Driven to refusal, the spread shank is compressed by the walls of the hole. Tie plates are held against horizontal and vertical movement under spring pressure. Play between the spike and the hole is eliminated—gage is held and plate cutting is overcome.

LOCK SPIKES not only become integral with the tie plate, but also the lateral pressure by the legs against the sides of the tie hole, binds the spike in the tie. This unique feature gives tight adhesion between tie and plate.

LOCK SPIKES were first installed in 1947. Since they have been in track, no maintenance whatever has been required. Cost of installing in track is low and comparable to cut spikes. The advantages and saving only found in Lock Spikes reduces the annual cost of ties in track and maintenance expense to a minimum. We invite your investigation.

BERNUTH, LEMBCKE CO., INC.

420 Lexington Avenue, New York 17, N. Y.

Inserting New Ties made easy *with this* WISCONSIN-Powered *Fairmont* TIE-BED SCARIFIER

Model VF4D Wisconsin V-type 4-cylinder Air-Cooled Power Unit specified as original equipment on Fairmont Tie-Bed Scarifier. 3¼" bore x 3¼" stroke, developing 15 to 25 hp. in a speed range of 1400 to 2400 rpm.

Increasing the efficiency and output of your tie renewal gangs is a cinch with this Fairmont Tie-Bed Scarifier.

One man rides the rails (under an umbrella if it's hot) and digs a uniform tie-bed ten ft. long in one minute or less! The only parts not fully loosened and dug out are the two short sections immediately under the rails. Inserting ties is speeded up and made easy.

The W87 Fairmont Scarifier is operated by hydraulic power throughout . . . and a Model VF4D Wisconsin V-type, 4-cylinder Heavy-Duty Power Unit supplies the dependable power for the operation of the hydraulic system. This engine is equipped with electric starter, generator and distributor and is provided with such heavy-duty service features as: tapered roller bearings at BOTH ends of the crankshaft; Stellite-faced exhaust valves, solid Stellite valve seat inserts and positive type valve rotators for minimum maintenance and long engine life. Extremely efficient AIR-COOLING eliminates manual cooling chores and cooling system breakdowns and permits efficient service at temperatures from extreme sub-zero to 140° F.

You can't do better than to specify "Wisconsin Power", supplied as standard equipment by leading manufacturers of maintenance-of-way equipment, such as Fairmont Railway Motors, Inc., of Fairmont, Minn.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
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WHEN YOUR TRACK BALLAST NEEDS CLEANING...

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SPENO contract service eliminates capital investment by Railroads in this single-operation equipment.

SPENO'S double screening system gives a thorough cleaning in less time than a single screening by other mechanical means.

SPENO Ballast Cleaning Equipment does not foul train traffic on adjacent tracks.

SPENO'S record of high production and low cost can be verified by the sixteen Class I railroads now served.

Just ask the Railroads that have used us.
FRANK SPENO RAILROAD BALLAST CLEANING CO., INC.
306 North Cayuga St., Ithaca, N. Y.

Railway Personnel (Cont'd)

ant and office assistant from January 1951 until his recent promotion as assistant to chief engineer.

J. W. Diffenderfer, who has been named assistant division engineer—special duty, in the office of the vice-president on the Pennsylvania (*RT&S*, July, p. 75), was born at Collingswood, N. J., August 27, 1921. He attended Bucknell University where he received a BS degree in civil engineering in 1943. Between 1940 and 1943 he worked part time as a trackman on the Pennsylvania-Reading Seashore while attending school, and began his railroad service on a full-time basis with the PRR in January 1943 as an assistant on the engineering corps. He left the PRR that same year for service in the U. S. Army Transportation Corps, returning to the railroad the following year. In December 1944 he was named assistant supervisor of track at Coshocton, Ohio, and was advanced to supervisor of track at Logansport, Ind., in June 1947. He subsequently served in this same capacity at Buffalo, N. Y., and Johnstown, Pa., until his recent promotion at Philadelphia.

L. E. Porter, master carpenter on the Rock Island at Des Moines, Iowa, has been promoted to division engineer on the Chicago Terminal division at Blue Island, Ill., succeeding **W. P. Hale,** who has been appointed assistant division engineer on the Burlington-Rock Island at Teague, Tex., replacing **T. W. Toal,** who has been appointed master carpenter at Des Moines, to succeed Mr. Porter.

N. E. Ekrem, who has been appointed assistant bridge engineer on the Great Northern at St. Paul, Minn. (RT&S, Aug., p. 54), was born at Mobridge, S. D., May

N. E. Ekrem

16, 1916. He attended the University of Minnesota where he received a BS degree in civil engineering in 1940. He began his railroad service with the Soo Line in December 1942. In February 1943 he joined the Great Northern's bridge department at St. Paul, beginning as a draftsman and serving successively as assistant engineer and structural engineer.

J. L. Southard has been appointed assistant office engineer on the Chesapeake & Ohio with headquarters at Detroit, Mich., succeeding **D. C. Alexander,** who has retired after 48 years of service.

J. Bryan McKerley, assistant chief engineer on the Central of Georgia at Savannah, Ga., has been appointed acting chief engineer replacing **H. Gray Carter,** who has been granted a leave of absence.

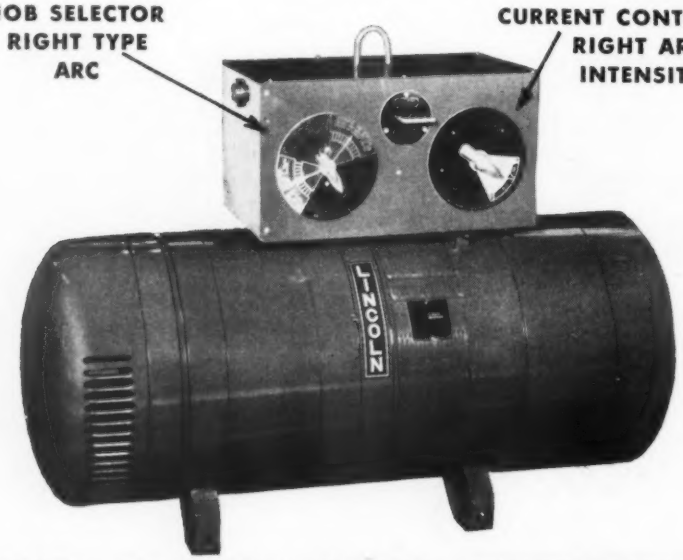
E. T. Franzen, assistant bridge engineer on the great Northern at St. Paul, Minn., has been appointed engineer of bridges on the Rock Island at Chicago, succeeding **J. F. Marsh,** whose resignation was announced in the August issue of *RT&S*.

S. M. Percival, assistant vice-president, maintenance and engineering on the Carolina & Northwestern, has been promoted to vice-president with headquarters remaining at Charlotte, N. C. Mr. Percival succeeds **M. Hurt Ramsey,** who retired August 1 after more than 46 years of service.

J. G. Murray, assistant division engineer on the Canadian National at Toronto, Ont., has been promoted to division engineer on the Atlantic Region with headquarters at New Glasgow, N. S., succeeding **R. F. Mackenzie,** who has been transferred to the Central Region.

J. W. McGlothlin, assistant division engineer on the Milwaukee at LaCrosse, Wis., has been promoted to division engineer at Aberdeen, S. D., succeeding **B. E. Daniels.** Mr. Daniels has been transferred to Milwaukee, Wis., to succeed **W. Lakosky,** who has retired after more than 48 years of service.

E. O. Williams, senior assistant en-



HOW TO CUT SHOP MANHOURS ...on repairs, construction

YOU can speed all types of repair and construction work by utilizing the faster, easier welding possible with Lincoln's Dual Continuous Control. Here's why:

1. **With the Job Selector,** you select the right type arc for both the joint and position.
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Thus, there is no compromise for speed, for ease of welding or quality of weld metal. *Every* weld is made at the lowest possible cost.

Dual Continuous Control is a feature developed by Lincoln and found only on "Shield-Arc" welders to save operator time and cost. That's why more "Shield-Arc's" are used by railroad shops than any other welder today.

SEE FOR YOURSELF. Compare "Lincoln's" money-saving features and low price. Bulletin 466, giving cost-cutting details, is available by writing the Lincoln Electric Sales Co., 11 Public Sq., Cleveland 13, Ohio. Railroad representatives of:

Speeds repair of truck bolster to AAR specifications as new center plate ring is welded at this Class I shop with Lincoln "Shield-Arc" welder and "Fleetweld 5" electrode.

Simplifies construction of cabooses by welding end sheets, end windows and side windows with Lincoln "Fleetweld 5" using "Shield-Arc's" versatile welding flat, vertical and overhead positions.

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THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

SAVE TRACK SPACE WITH Q AND C CAR STOPS

Q and C Car Stops are economical because they require very little track space and a minimum of labor for application. They wedge firmly to the rails. No drilling is necessary.

One size is suitable for all sections of rail used in yards and side tracks.

Specify them on your requisitions.

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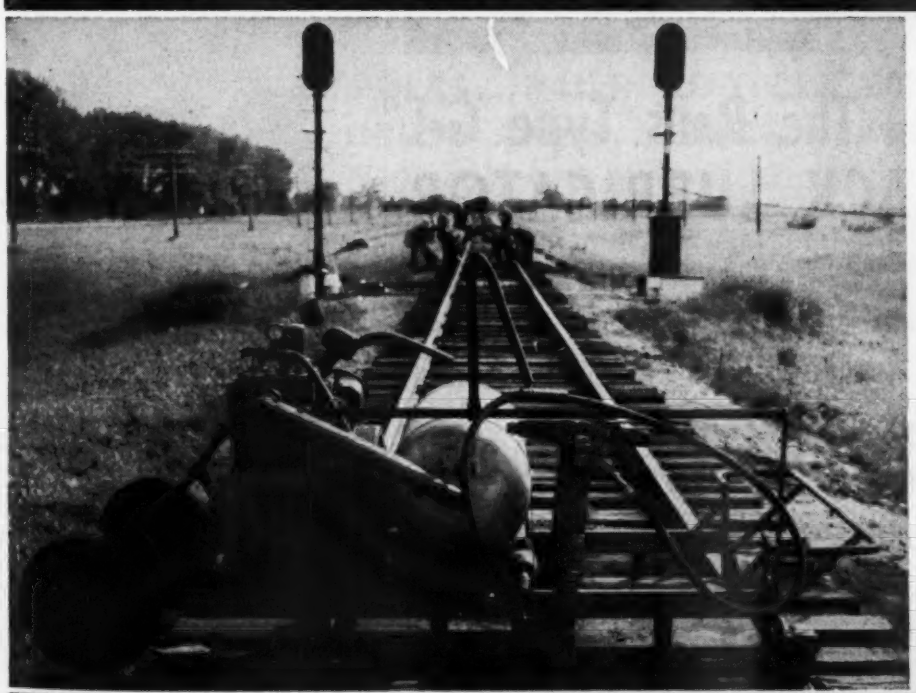
WOOLERY PNEUMATIC . . . SPIKE DRIVER



MEDIUM WEIGHT HARD HITTING

Designed primarily for use by tie renewal gangs. Various other pneumatic tools can also be operated with it when not being used for spike driving.
Brakes are automatically applied to 2 of the 4 flanged wheels to hold the machine in place when spikes are being driven.
When pressure is applied to the push handle the brakes are automatically released and the entire unit rolls easily on roller bearings.
Two lever operated pneumatic tired set-off wheels permit removing the unit from the track in less than a minute by two men.

COMPRESSOR: 55 C.F.M. Duplex Cylinder
ENGINE: Wisconsin Twin Cylinder, 13 H.P.
DRIVE: Multiple V-Belt
HAMMER: THOR 60-pound
TANK: A.S.M.E. Standard with Safety Valve
FRAME: All steel, welded
TRACK WHEELS: 6-inch roller bearing
SET-OFF WHEELS: 8" x 4.00 pneumatic-tired, roller bearing
BRAKE: Two-wheel, automatic applied
WEIGHT: 760 pounds

WOOLERY MACHINE COMPANY
29th and Como Ave. S.E.
Minneapolis 14, Minn.
Pioneer Manufacturers of Railway Maintenance Equipment

Railway Personnel (Cont'd)

gineer on the Southern Pacific at El Paso, Tex. has been promoted to division engineer at the same point, succeeding **L. E. Lyon,** who has been transferred to Tucson, Ariz., Mr. Lyon succeeds **T. W. Saul,** who has retired. **C. W. Collins,** has been named senior assistant division engineer at El Paso, replacing Mr. Williams.

Track

J. H. Gibbs, roadmaster on the Southern Kansas division of the Missouri Pacific, has retired after 42 years of service.

Valdemar Johnson has been appointed assistant supervisor of track on the Chesapeake & Ohio at Detroit, Mich.

W. A. Scribner, general foreman on Erie, has been promoted to track supervisor on the Alleghany division, with headquarters at Cuba, N. Y., succeeding **W. E. Pierson,** who has been assigned other duties. **C. S. Bray,** has been appointed track supervisor on the Buffalo division with headquarters at Warsaw, N. Y., replacing **John Krizman,** who has been transferred.

W. G. Park, track supervisor on the Southern at Prinecton, Ind., has been appointed B&B supervisor at the same point, succeeding **L. D. Beatty,** who has retired after 44 years of service. **J. W. Hinton,** track supervisor at Somerset, Ky., has been transferred to Princeton, replacing Mr. Park. **R. A. Wharton,** track supervisor at Jackson, Ala., succeeds Mr. Hinton at Somerset. **R. C. Cromer,** assistant supervisor in the office of the chief engineer, Western Lines, has been promoted to track supervisor at Jackson, replacing Mr. Wharton. **F. B. Lindsay, Jr.,** track supervisor at Cochran, Ga., has been transferred to Charleston, S. C., succeeding **R. P. Taylor, Jr.,** whose promotion to assistant trainmaster is noted elsewhere in these columns. **O. J. Thomas** has been appointed track supervisor at Cochran, replacing Mr. Lindsay.

Bridge & Building

U. L. Burlock, shop foreman on the Bangor & Aroostock, has been promoted to assistant to the superintendent of bridges and buildings at Bangor, Me.

Mr. Burlock was born in 1916 at Mt. Pleasant, N. B., and attended school at Houlton, Me. He began his railroad service on the B&A as a carpenter in 1937. In 1947 he was promoted to shop foreman and served in that capacity until his recent promotion.

Special

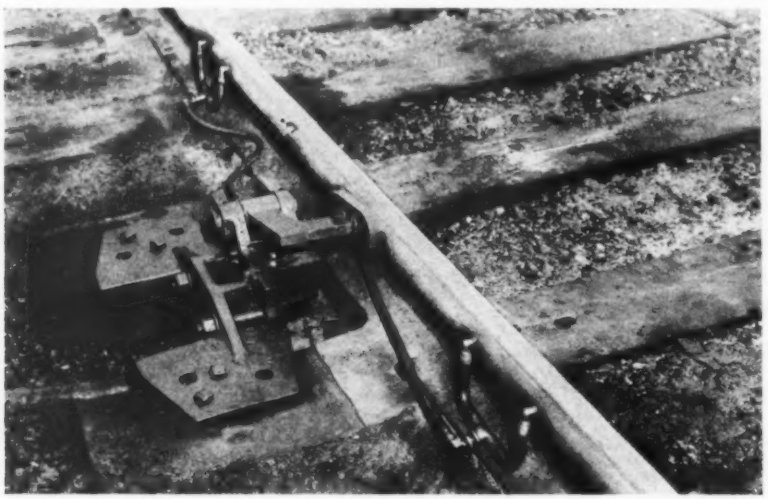
J. C. Hamlin has been appointed acting timber treating engineer on the New York Central with headquarters at Rome, N. Y.

Paul Martin, whose appointment as superintendent of maintenance equipment on the New York Central was announced recently (*RT&S*, Aug., p. 60), was born at Winona, Minn., January 23, 1911. He attended Cotter high school at Winona and St. Mary's College before joining the Chicago & North Western, as a track-welder helper in September 1937. In

Paul Martin

1940 he was appointed work equipment inspector on the Wisconsin division, and in 1943 was named general scale and work equipment inspector, system. In 1947 he was appointed work equipment shop foreman at Fond du Lac, Wis., serving there until being appointed superintendent of work equipment on the Denver & Rio Grande Western at Denver, Colo. in February 1950. He held this position until recently.

C. C. Jacobson, who has been appointed superintendent of scales on the Illinois Central at Centralia, Ill. (RT&S, Aug. p. 60), was born at Chicago, November 11, 1897. He attended the University of Illinois where he received a BS degree in mechanical engineering in 1923. Following graduation he joined the Inland Steel Company at Indian Harbor, Ind., as a designer. In 1935 he joined the Link Belt Company, serving there



NEW! . . The Rails Type G-1 TRACK LUBRICATOR

For efficient, low-cost graphite grease lubrication on curves, switch points, frogs and crossings. Can be applied on tangent or curved rail. The G-1 Lubricator does not require a wearing strip or distribution bar thus eliminating the fouling of the lubricator with sand. The grease is rail fed and you drill the rail exactly where you want the grease to contact the flange of the wheel.

Write for complete information.

The RAILS Company

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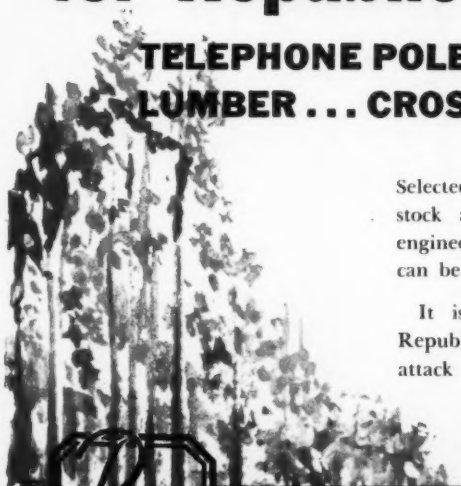
for Republic Pressure Creosoted

TELEPHONE POLES... RAILROAD TIES... WOOD BLOCKS
LUMBER... CROSS ARMS... PILES... ANCHOR LOGS



Selected trees that become Republic Creosoting Company's white stock are pressure treated with Creosote. These timbers become engineering structures of exacting dimensional specifications and can be counted on for years of useful service.

It is smart to order Pressure Creosoted Wood products from Republic . . . made from selected trees . . . made resistant to attack from insects and fungi.

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YOU CAN BUY A BANTAM
ANY WAY YOU WANT IT!

AS A CRAWLER

CARRIER MOUNTED

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There's a model Specially designed for Your jobs!

Whether you're digging a trench, handling materials, erecting steel or pouring concrete, there's a BANTAM to fit the KEY SPOT on that job! Schield Bantam builds just one size machine . . . builds more of them than anyone else . . . builds them to do *more* jobs for you with any of 9 different attachments.

For special applications or routine jobs, there's a BANTAM that can do your work faster with more profit for you! Find out about a BANTAM before you buy any ⅜ yd., 5-6-7 ton shovel-crane!

WE HAVE A NEW 7 TON BANTAM

Now, to let you handle bigger lifts, Schield Bantam offers a 7-TON CRANE on Heavy-Duty "300" Crane Carrier! You can also get 5-ton (Crawler) and 6-ton (Carrier and Self-Propelled) cranes to fit your job needs . . . the most complete crane line-up in the ⅜ yd. field!

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284 PARK ST., WAVERLY, IOWA, U.S.A.

WORLD'S LARGEST PRODUCERS OF TRUCK-CRANES AND EXCAVATORS

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SEND INFORMATION ON:

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Name _____ Title _____

Company _____

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City _____ State _____

Railway Personnel (Cont'd)

until becoming senior mechanical draftsman for the People's Gas Light & Coke Company at Chicago in 1938. He began his railroad service with the Illinois Central as a structural designer in the building department at Chicago in May 1943.

F. L. Owens, who has been appointed assistant superintendent, maintenance of way, on the Norfolk Southern at Raleigh, N. C. (*RT&S,* Aug., p. 57), was born at Star, N. C., July 2, 1908. He began his railroad service with the Norfolk South-

F. L. Owens

ern as a section laborer in July 1922, later serving as assistant foreman and section foreman, until being appointed assistant track supervisor at Star in November 1942. He was named track supervisor at that point in June 1943 and became general roadmaster at Raleigh in January 1951.

L. C. Collister, who has been named manager, tie and timber treating department-system, on the Santa Fe at Topeka, Kan. (RT&S, Aug. p. 60), was born at Paonia, Colo., September 12, 1915. He attended Mason City Junior College and Iowa State College.

L. C. Collister

He began his railroad service with the Santa Fe in August 1940 as a chemist in the treating plant department. During World War II he served in the naval reserves as a liaison officer with the air forces in the Central Pacific area. He returned to the Santa Fe in 1946 as a

WM
WESTERN MARYLAND RAILWAY

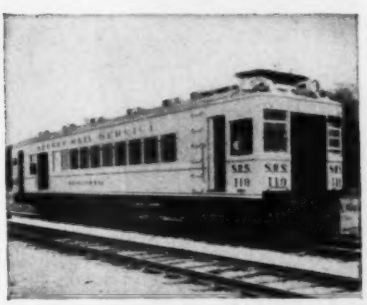
finds SPERRY RAIL SERVICE helps keep track structure sound

"We nip potential hazards in the bud by regularly testing our rail for defects with Sperry Rail Service," says Mr. F. L. Etchison, Chief Engineer, Western Maryland Railway Company. "These tests help us to keep our track structure sound. They also build employee and customer confidence by this indication of our desire for only the best rail in our track."

"Western Maryland was chartered in 1852 as the Baltimore, Carroll and Frederick Railroad," states Mr. Etchison. "Through mergers and reorganizations, WM today is the outgrowth of more than 30 railroads, several of which played memorable roles in great moments of American history. WM is proud of its history and prouder still of its present-day reputation for efficient service, and we are constantly striving to uphold this reputation. For example: to protect WM track, such as this stretch west of Hagerstown, from service failures, we have employed Sperry Rail Service continuously since 1934, first annually, and now for many years each Spring and Fall."

"Locating and marking rail defects hidden from visual inspection is the most valuable aspect of Sperry testing," Mr. Etchison adds. "A segment of track may look good and ride well, yet when Sperry reports a defect, we quickly relegate that rail to a yard or track restricted to light tonnage and low speed. Likewise, if we are re-laying a segment of track and the released rail has a good record under Sperry test, we feel confident that it can be safely placed in any track carrying our principal traffic."

"Our completely dieselized Fast Freights, such as the one above leaving Baltimore with a tonnage train for the Middle West, give dependable, on-time service day in and day out," Mr. Etchison continues. "With sound track we can meet our fast freight schedules without fear of disrupted service. And Sperry's efforts have materially assisted in our performance, for our records show that in each Sperry test, a big majority of defects found are in the very small size group."



Sperry is proud of its time-proved slogan, "Leaders since 1928 in nondestructive testing." We offer America's most complete line of induction and ultrasonic testing equipment for practical railroad applications—testing rail in track, diesel axles, wheels and many other vital components. Phone or write today for complete information.

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SPERRY RAIL SERVICE

Division of Sperry Products, Inc.
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POWER TOOLS

ELECTRIC HAMMERS and "Self-Rotating ELECTRIC HAMMER DRILLS
For fast, easy cutting, chipping or drilling in concrete

Belt-Driven ELECTRIC SAWS
Cut wood, concrete block, plasterboard, etc., 2-13/16" and 3-1/4" cuts.

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100% Self-Contained GASOLINE HAMMER
Paving Breakers
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No air compressor needed to deliver 2000 powerful blows per minute.
Cleans holes automatically down to 13 ft.
Write today for illustrated Tool Catalogue - FREE.

SYNTRON COMPANY
290 Lexington Ave. Homer City, Pa.

Railway Personnel (Cont'd)

chemist at the Somerville treating plant and in 1949 was promoted to superintendent of the Albuquerque (N.M.) plant.

E. L. Rudisill, supervisor work equipment on the Southern at Greensboro, N. C., has been appointed general foreman of the Charlotte (N. C.) roadway shop. **J. T. Hayden,** supervisor work equipment at Charlotte, has been transferred to Greensboro, to succeed Mr. Rudisill. **A. H. Steele** carman welder, has been advanced to supervisor work equipment at Charlotte, succeeding Mr. Hayden.

Obituary

J. M. Short, general water service inspector on the Texas & Pacific at Dallas, Tex., died June 24.

Association News

Northwest Maintenance of Way Club

The first meeting of the season will be held on September 22 at the Midway Civic Club, 1931 University Avenue, St. Paul, Minn., starting at 6:30 p.m. Two films will be shown, both produced by the United States Steel Corporation. One of these, entitled "The Waiting Harvest," will deal with chemical derivatives of coal. C. W. Johnson of United States Steel will speak briefly to introduce this film. The other picture, entitled "P. S.—Pole Security," will show the treatment of timber poles.

Railway Tie Association

The annual convention of the Association will be held at the Peabody Hotel, Memphis, Tenn., on October 26-28. The annual luncheon will be held on Thursday, the 27th. H. J. McKenzie, president of the St. Louis Southwestern, will address the luncheon. The president's reception will be held on the first evening, and the annual dinner on the second evening, both at the Peabody hotel. Other details of the program will be announced later.

American Railway Engineering Association

Two new committee chairman and two new vice-chairmen have been appointed by the Board Committee on Personnel. They are: C. E. Weller, division engineer, Illinois Central, formerly vice-chairman of the special committee on Continuous Welded Rail, who has been appointed chairman of that committee, and J. C. DeJarnette, Jr., chief engineer, Richmond, Fredericksburg & Potomac, who has been appointed vice-chairman. Mr. Weller succeeds L. F. Racine, chief engineer, Chicago, Indianapolis & Louisville, who is retiring from railroad service. A. R. Harris, engineer of bridges, Chicago & North Western, formerly vice-chairman of the committee on Iron & Steel Structures, has been appointed chairman of that committee, and D. V. Messman, engineer bridges, Central Lines, Southern, has been appointed vice-chairman. Mr. Harris succeeds J. F. Marsh, formerly engineer of bridges, Rock Island, who has resigned.

Eleven committees have scheduled meetings to be held during the month of September. Seven of these meetings will be held in Chicago in conjunction with the annual conventions of the Roadmasters and Maintenance of Way Association and the American Railway Bridge & Building Association, September 19-21. These are: Track—September 21; Build-

Organizations

American Railway Bridge and Building Association—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5. Next annual meeting, September 19-21, 1955.

American Railway Engineering Association—Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—S. Kosco, Secretary-Treasurer, 135 East Eleventh place, Chicago 5.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive street, St. Louis 1, Mo.

National Railway Appliances Association—Kenneth Cavins, Secretary, 310 S. Michigan avenue, Chicago 4; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Northwest Maintenance of Way Club—L. C. Blanchard, secretary-treasurer, Room 27, Milwaukee Depot, Minneapolis 1, Minn.

Railway Tie Association—Roy M. Edmonds, Secretary-Treasurer, 1221 Locust street, St. Louis 3, Mo. Next annual meeting, October 26-28, Peabody Hotel, Memphis, Tenn.

Roadmasters' and Maintenance of Way Association of America—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5. Next annual meeting, September 19-21, 1955.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

ings—September 20-21; Masonry—September 20-21; Highways—September 20-21; Records and Accounts—September 20-21; Contract forms—September 20-21; and Waterproofing—September 20. The other five committee meetings and their locations are as follows: Roadway and Ballast—September 20-21 at Duluth, Minn.; Water, Oil & Sanitation Services—September 13 at Chicago; Yards and Terminals—September 26-27 at Cincinnati, Ohio; and Economics of Railway Location and Operation—September 19 at South Bend, Ind.

Supply Trade News

General

The **American Hoist & Derrick Co.** has announced the appointment of **Eastern Railway Supply, Inc.,** New York City and **Stanley H. Smith & Co.,** Cleveland Ohio, as its railroad sales representative for the American line of rubber-mounted cranes.

Mid-West Forging & Manufacturing Co. has announced the appointment of the **Harrison Railroad Supply Company,** Chicago, as its representative for the sale of the Improved Gautier rail anchor to most of the railroads in the Chicago territory.

The **Matisa Equipment Corporation** has announced that the construction of its new assembly plant and warehouse has advanced to a point where the company is now occupying its new offices at the plant location, 1020 Washington Ave., Chicago Heights, Ill.

The Koppers Company, Inc., has purchased production facilities for manufacturing anti-checking irons for railroad crossties.

The facilities have been acquired from the **Brainard Steel Division** of **Sharon Steel Corporation** and have been housed in a new 30-ft. by 90-ft. building erected at the Kopper wood preserving plant at Orville, Ohio.

It is announced that Koppers will produce 15 different types of anti-checking irons from several grades of steel. They will be available in sizes from 3 in. to 6 in. in the regular "C" and "S" shapes, plain or crinkled, and with or without rib.

A new company, **Brantford-Holan Limited,** has been formed at Brantford, Ont., to manufacture, assemble and market Holan utility bodies and power equipment exclusively for Canada. The new organization is jointly owned by **J. H. Holan Corporation,** Cleveland, Ohio, and **Brantford Coach & Body Ltd.,** Brantford.

Personal

Robert J. Sudlow has been appointed district representative for the **Frank G. Hough Company** in the New England states area.

A. Milton Wells, has been named field engineer for the **Mid-West Forging & Manufacturing Co.** at Chicago. Mr. Wells' work will be in connection with the Improved Gautier rail anchor.

Anthony A. Pack, formerly associated with Vickers, Inc., has been named to the newly created position of assistant to the president of the **Hyster Company** at Portland, Ore.

E. B. Hill formerly vice-president and director of sales, advertising and export for Gar Wood Industries, Inc., has been appointed to the newly created position of assistant to the president of the **Koehring Company** at Milwaukee, Wis.

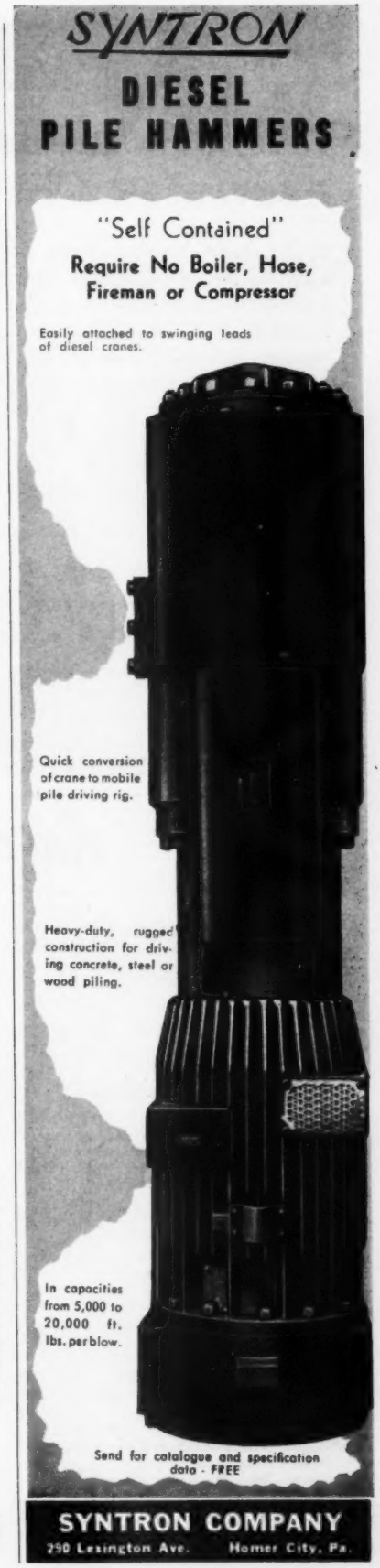
William O. Robertson, vice-president and manager of the Eastern division of **Armco Drainage & Metal Products, Inc.,** has been named vice president in charge of sales, and **Tom M. Neibling,** vice-president and manager of the Southwestern division, has been transferred to the Eastern division to succeed Mr. Robertson. **W. W. Mains,** vice-president and manager of the Missouri-Kansas division, becomes vice-president and manager of the Southewestern division, replacing Mr. Neibling, and **A. J. Mistler,** division sales manager for the Missouri-Kansas division, has been advanced to division manager on the same territory, succeeding Mr. Mains.

Mr. Robertson began his Armco service in 1929 with the Ingot Iron Railway Products Company, and moved to the Drainage Engineering Company in 1930. He became New York City district manager for the latter company in 1938. In 1939 he became Eastern District manager for the Armco Railroad Sales Company, remaining there until 1943, when he was appointed assistant manager of the Construction division of Armco Drainage. He was promoted to eastern manager of railroad sales in 1945, and the following year was promoted to Eastern Division sales manager. Mr. Robertson became manager of the division and a vice-president in 1953.

William O. Robertson

Obituary

Jack Canning, president of the Southwestern Petroleum Company, Inc., Ft. Worth, Tex., died on August 5.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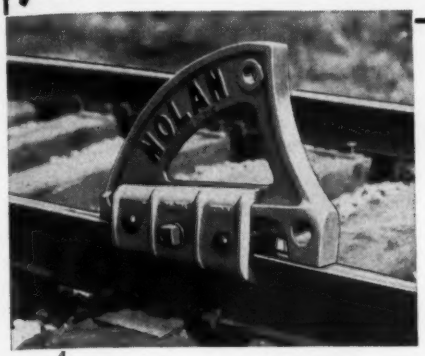

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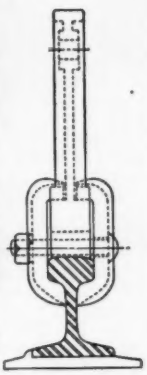

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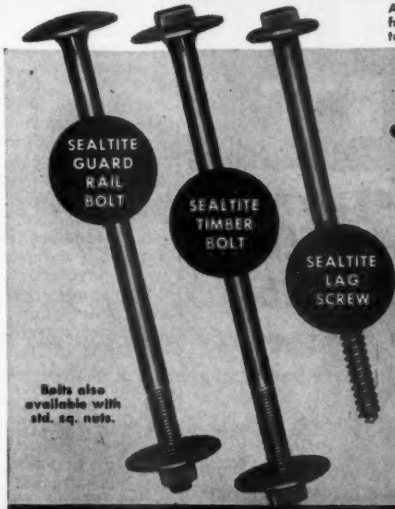

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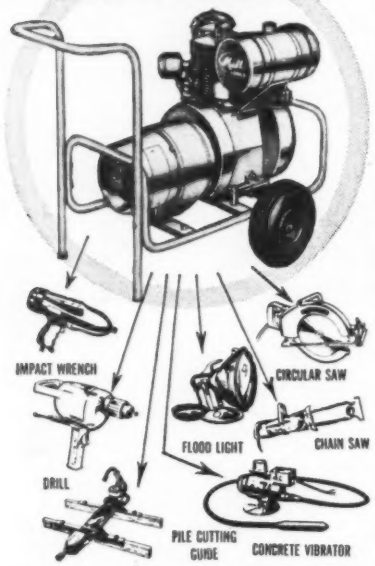

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2. TWIN CRAWLER TRACTOR. *Euclid Div. General Motors Corp.* 4-page 3-color catalog (601) describes and gives specifications on the new Euclid TC-12 Twin Crawler Tractor; includes several on-the-job photos.

3. GASOLINE ENGINE. *International Harvester Co.* 8-page illustrated folder describes the U-164 power unit, a 4-cylinder valve-in-head gas or gasoline power unit which develops 36.5 hp. at 1,800 rpm.; includes full specifications and performance charts, and describes attachments available.

4. DRAINAGE PRODUCTS. *Armco Drainage & Metal Products, Inc.* 4-page bulletin (12454) "Ready Where and When You Need Them . . . Armco Drainage and Construction Products" describes, illustrates and gives helpful data in chart form on Armco drainage and construction products; map pinpoints plants and sales offices; gives quick service for products, engineering data and assistance.

5. PORTABLE GENERATOR. *D. W. Onan & Sons, Inc.* Complete information offered on the new completely self-contained lightweight portable generator (2500-watt Onan Electric Generating Plant) designed with special external modifications to operate any transformer type AC welder up to 150 ampere rating.

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7. WIRES AND CABLES. *Wire & Cable Dept., General Electric.* 12-page 2-color booklet (19-594) "GE Silicone Rubber Wire and Cable" describes, illustrates and gives specification data on Silicone rubber-insulated high-temperature wires and cables including power cable, control cable, appliance and fixture wires, apparatus leads, generator leads, etc.

8. PAINTS & FINISHES. *Industrial Paint Div., Pittsburgh Plate Glass Co.* Handy desk-size manual "Railway Structural Maintenance Finishes" contains complete descriptions with color sample chips of all Pittsburgh railway structural paints; includes suggestions for proper application and maintenance.

9. ADHESIVES, COATINGS, SEALERS. *Minnesota Mining & Mfg. Co.* Illustrated folder describes the use of "3M Brand Adhesives, Coatings and Sealers" for joint-sealing, and bonding and protecting sheet metal; includes applications for nine of the company's materials.

10. DOOR CLOSERS. *The Norton Door Closer Co., Div. Yale & Towne Mfg. Co.* Catalog 54 describes expanded line of door closing devices, the four lines of closures: "Inador" concealed, surface mounted, lintel concealed, screen door closures; includes complete specifications, cutaway drawings, operating data, installation dimensions.

11. TANK CAR COATING. *MW Protective Coatings Div. Metalweld Inc.* 4-page illustrated reprint-bulletin "Lining and Coating Tank Cars" covers use of sheet linings, liquid synthetic resin coatings, sprayed metal coatings and combination coatings to protect equipment from chemical attack, products from contamination.

12. SUPPORT JACKS. *J. H. Holan Corp.* 2-color 3-hole punched descriptive bulletin gives dimensional information, performance data, and with diagrams describes how exclusive Holan Self-Stowing Hydraulic Support Jacks Work.

13. LOCKS & HARDWARE. *Yale & Towne Mfg. Co.* New Yale industrial catalog covers Yale locks and hardware for many uses, including: prefabricated wood and metal doors, overhead doors, cabinets, locker locks, etc.; includes exact dimensional drawings with halftone photos, federal specifications.

14. CORROSION SERVICE. *MW Protective Coatings Div. Metalweld Inc.* Complete information on this company's Technical Service given in manual for industries interested in surface preparation, synthetic resin coatings, rubber, neoprene linings, metallizing, combination coatings, hot water tank linings and tank fabrications; has corrosion questionnaire.

15. SELF-LOCKING NUTS. *Standard Pressed Steel Co.* 4-page 2-color illustrated folder (866) "Flexloc Self-Locking Nuts," with drawings shows the locking action of the one-piece all-metal nut used either as a locknut or a stop nut; drawings depict numerous applications of the nut.

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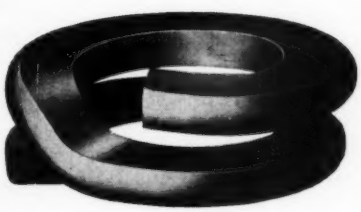

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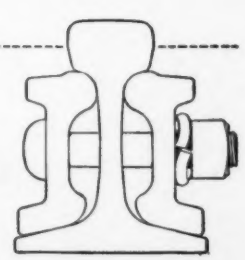

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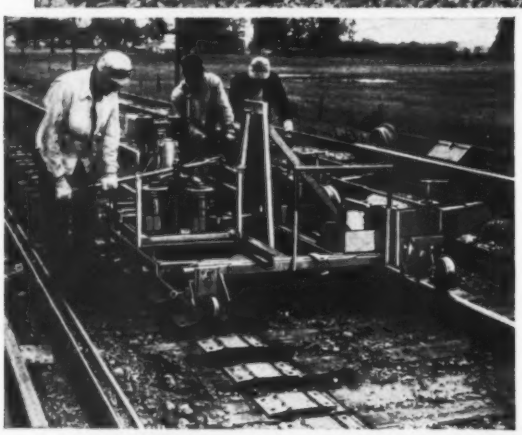

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